COAL AGE

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# The Coal Business of Tomorrow

BY FLOYD W. PARSONS

WHAT is the nature of the situation we are approaching? That is the question common in the minds of all coal-mining people. Like most of our important basic industries, the coal business is caught in the cycle of a great change. Not only is this true in the social side of the industry, but it is also a fact in the physical end of the mining business.

In many famous coal regions, such as Cambria and Clearfield Counties in Pennsylvania, the original areas are practically worked out. Operating companies are now going over their acreage, taking out pillars and working low-grade thin seams. Some beds are being worked that wouldn't have been looked at five years ago. All of this means high operating costs and a lower grade of product.

Ten years ago the Freeport seam near Pittsburgh, in Allegheny County, sold for $50 per acre; recently this same coal sold for as high as $700 per acre in blocks. In southern West Virginia, no longer than a decade ago, coal leases were made on a royalty basis of 6 to 10 cents per ton; now they range from 25 to 30 cents per ton. Many great industrial companies, especially large steel corporations, are experiencing difficulty in getting a supply of the proper grades of coal. Some of them have already decided that the only solution for their fuel problem is to secure acreages of inferior coal and carefully prepare it at the mine.

We know now that the mining waste of the old days was appalling and unnecessary. But nevertheless it was in keeping with those prodigal times. The railroads are largely responsible for the conditions that existed. Coal fields were opened chiefly to get freight tonnage for the roads. These carriers also fixed the price and dictated the point where the coal should be sold, so as to reap the benefit of a long haul and a high freight rate. Is it any wonder that mining was an unprofitable industry when in reality it was a sort of subsidiary business carried on to fatten the treasuries of great transportation systems?

But that time is no more. High-grade coals are growing scarcer daily. No new fields are being discovered, and none will be. The people understand at last the value of our coal heritage. The Government, acting as the representative of the people, will see that no further reckless wastes are permitted. Higher prices, urgent industrial needs and the competition of fuel oil will necessitate the application of science to every phase of mining. The entrance of America's largest financial interests into the coal business further insures a new and greater degree of stability in the industry.

The coming decade will see greater advances in coal mining than ever before, but the progress will not be along the same lines. The tomorrow of the colliery owner will be replete with developments having to do entirely with the art of utilizing fuel, and not so much to do with the art of producing it. The problem will be to redeem all the values locked up in the coal rather than to simply mine and wastefully burn the native article. Instead of shipping all our output in bulk by rail, we will save millions of dollars worth of valuable coal products and transmit the remaining energy of the fuel by wire to the point where the power is needed. Private interests must at last give way to national economy.

If coal operators continue to be indifferent to the methods of coal consumption, the immediate future lies dark ahead. Oil from Mexico has replaced one million tons of coal in New England since the war ended. This same competitor threatens the whole coal business of the Atlantic seaboard. The Mexican oil fields are one of the prizes of the world. It is only necessary to turn a few valves to increase the output of Mexican oil 400 per cent. Gas is the perfect fuel, but it cannot be transported long distances. Oil, therefore, at present is our supreme fuel. This would not be the case if no heat were lost in burning coal. The time has come when colliery owners must lock arms with science if they intend to march to victory.

# IDEAS AND SUGGESTIONS

## Robbing Pillars in Anthracite Mines

BY JOSEPH R. THOMAS
Assistant Mine Foreman, Plymouth, Penn.

Robbing pillars in the anthracite mines sometimes presents many difficult problems to the mine foreman and the men actually engaged in the work. An important and most difficult thing is to safeguard the lives of the workmen from falls of roof and rib. In order to eliminate these accidents as far as practicable, it requires a careful daily inspection of all working places while the men are at work. The person making the inspection gives instructions to the miners in regard to setting the necessary props and other timbers. But as the work of drawing pillars progresses it is sometimes found rather difficult to keep the workings supplied with pure fresh air. When pillars are taken out the sectional area of the opening is increased many times what it was previous to the work of robbing. Therefore, the velocity of the air is reduced so low that the smoke caused by the blasting hangs for some time before it is carried away. Furthermore, where robbing is carried on in more than one lift that is ventilated by the same split it is found increasingly difficult to maintain sufficient ventilation.

The cost of timbering in drawing pillars is so high in some seams in the anthracite region as to make robbing almost profitless to the operator. It is in these bad seams that the mine foreman is confronted with many perplexing conditions, in order to produce the coal at the lowest price per car possible. In order to do so he must be constantly on the lookout for miners who do unnecessary propping and timbering in order to make high wages. And permit me to say that it is right here that the foreman has to use his best judgment in regard to safety and cost; the foreman should be thoroughly acquainted with the nature of the roof that is to be supported, for sometimes he has to censure the miners for doing unnecessary timbering. Then the miners will come back at him and say: "The roof is bad." "Me 'fraid to work that place, me no stand lotse props." What is left for the foreman to do but to use his best judgment and try to explain to the miners the best possible way to protect their lives and at the same time reduce the number of props used daily.

It is evident that one prop or set of timbers that is properly placed may be equivalent to half a dozen that are set in a hurried and improper manner. Where props are use extensively it is sometimes found advisable, in case the roof is of a broken-up nature, to use extra long cap pieces on the props. For while the cap piece itself does not hold the roof, it offers a good warning to the miner that the weight is getting heavy on the props. And it is my opinion that where it is not necessary to support the roof in order to protect the surface plant, much of the timber employed could be recovered and used the second or third time. By adopting some means of drawing the timber and allowing the roof to fall, the weight would be decreased on the pillars and the work of robbing would be much safer for the miner and cheaper for the company. The increasing cost of timber will in time necessitate the greater use of steel and cement props for supporting roof at other points in mines than shaft bottoms and partings.

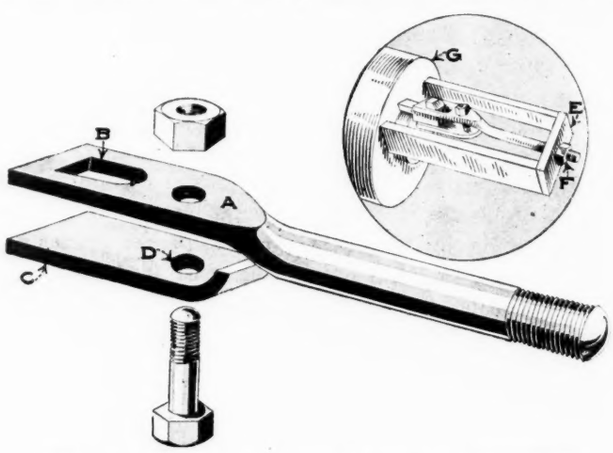
In flat or moderately inclined seams the pillars can be extracted much more easily than in seams pitching from 20 to 30 deg., other conditions being favorable. As the work of drawing pillars involves considerable expense for timber, I would like to hear what others have to say on this subject in the columns of *Coal Age*, and I would also like to know whether there is any machine or apparatus for drawing timber from worked out areas. I hope to receive the advice of others who have had considerable experience in this line of work.

[The "Sylat" post puller, made by W. Sylvester, of Parkersburg, W. Va., is used not only to pull props but also to afterward drag them away without danger to the workman.—EDITOR.]

## Practical Key Extractor

BY CHARLES H. WILLEY
Concord, N. H.

The key extractor here shown is made with a bolt of suitable size and strength for the key that is to be extracted. The illustrations give both detail and working views. To make the device calls for no great amount of skill. The bolt is heated and flattened to half thickness, and the flattened section (*A* Fig. 1) is offset a little. A hole to fit the key head is drilled and filed at



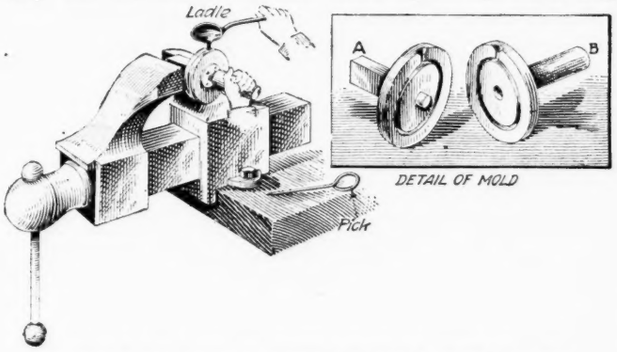

DETAIL AND WORKING VIEWS OF AN EFFICIENT KEY EXTRACTOR

*B* and a small strap made of flat steel, as at *C*, is also made, and holes drilled for bolting these two parts together, as at *D*. In operation the slotted part is placed over the key head with the strap on the under side, and then the two are bolted together. Suitable distance pieces and the strong back *E* are put in place, and while tightening up the nut *F*, hammer blows are struck on the hub at *G*. The key will respond to this device almost every time.

## Homemade Lead Gasket Outfit

By J. L. Ball
Amsterdam, Ohio

At all mine plants where water-tube boilers are used, some arrangement should be made to have a gasket-making outfit to furnish lead gaskets for the handhole plates. Notwithstanding that some composition gaskets give good service while in use, it is impracticable to employ them more than once. Furthermore, should the feed water be of such a nature as to necessitate frequent washing out, or turbining, of the tubes, these purchased gaskets constitute quite an item of expense. On the other hand, lead gaskets give excellent satisfaction; they can be used time and time again by remelting




DETAILS OF A HOMEMADE LEAD GASKET OUTFIT

them and remolding; and aside from the initial expense for apparatus and lead, the cost for making them is small. With a little experience a man can mold enough gaskets during his spare time to last quite a while. Though lead deteriorates, still, if care is exercised in saving all scrap and old gaskets, it is not often necessary to use new metal.

The outfit shown has been used for several years and has been copied (with modifications to suit local conditions) by engineers at various mines and manufacturing plants. The mold is readily constructed as follows: It is made from two pieces of ½-in. sheet iron which can be turned up in a lathe, the faces being machined so that they form a perfect joint when placed together; otherwise the hot metal would work out through the joint of the mold. The size of the mold depends on the size of the boiler handhole. If the boiler has 4-in. tubes, then the handhole will be slightly larger. In this case the mold will be about 6½ in. in extreme diameter. As shown in the illustration, the two parts of this mold are practically duplicates of each other. A square-cornered shallow circular groove is formed in each face, about ⅜ in. wide and $\frac{1}{16}$ in. deep, the inside diameter of the groove being 4¼ in. and the outside diameter 5 inches.

Each part of the mold, as shown in detail, has a handle. The handle *A* is made of a ¾-in. bolt flattened so that it can be held in a bench vise. It is screwed through one part of the mold. The projecting end is machined free of threads and is used for a dowel or centering pin, snugly fitting a hole in the other part of the mold. The handle *B* can be made of wood, asbestos, or any other substance that does not conduct heat readily. When assembled the two parts of the mold are held in position as shown. An aperture is provided in the mold for receiving the molten metal, a passage ½ to ¾ in. wide and the same depth in each half of the mold as the depth of the gasket mold, being large enough.

Having a mold, crucible and lead, small ladle and a small pick, we are ready to begin operations. The pick shown in the illustration is used to free the gasket from the mold. A small ladle is preferable for pouring, as it can be handled more easily than a large one. After the lead has been melted, it is good practice to submerge the mold in the hot metal until the mold is hot enough to prevent the lead from chilling when it is poured. If the mold is heated to the same temperature as the molten metal, the lead will not "freeze." A little experience will familiarize anyone with these small but quite important details. However, success depends upon the following point more than anything else: When pouring, work fast. Do not forget to oil the mold after using it; this will keep it in good condition until the next time it is to be used. Schemes of this kind not only may save money for manufactured supplies, but there are often odd times when men about a plant can fill out a day on a little job of this kind.

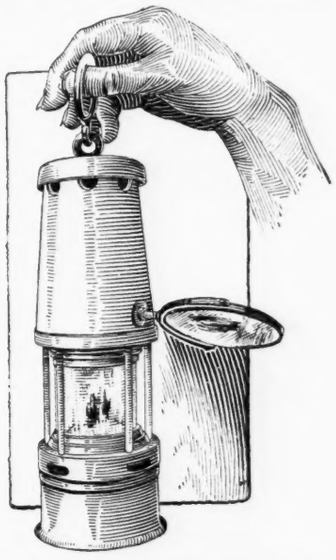
## To Counteract Effect of Acid Water

Slaked lime, introduced into the breaker "wash water" cistern at regular intervals, is the latest method being tried at several anthracite collieries to counteract the acids and effect a saving of shaker plates and chute linings. Where the fall of coal in transit through the breaker is not too great, it has been found practical to use terra cotta plates, 1¼ x 12 x 24 in. for chute lining. They give better results than tank steel and are practically acid-proof. They cannot be used where heavy lumps are handled at high speed.

## Mirror Attachment for Safety Lamp

By Gaston F. Libiez
Peru, Illinois

When testing for gas with a small flame on the safety lamp, it is difficult to watch the flame with a lamp raised to arm's length, as for instance, when testing in



SMALL MIRROR REFLECTS ANY MOVEMENT OF FLAME

a roof pocket. A small tilting mirror attached at the side and over the glass-protecting standards, as shown in the accompanying illustration, will reflect any movement of the flame without tilting the lamp.

# Reserve Coal Deposits Are Blocked Out at Government Mine at Eska, Alaska*

By Sumner S. Smith
Alaskan Engineering Commission, Eska, Alaska

SUFFICIENT reserve coal deposits have been blocked out at the coal mine operated by the Alaskan Engineering Commission at Eska, Alaska, to insure an adequate fuel supply for several years. Further prospecting continues in order to determine the regular areas of both the Eska and Chickaloon mines and to discover, if possible, other and better beds of coal. The output at present has been raised to a point high enough to insure an ample supply of fuel for all operation and construction purposes and to build up a surplus large enough to protect against delays due to interrupted traffic and accidents at the mining property.

Five additional acres have been cleared in the Eska townsite, three new houses completed and a gravity water system installed. The electric light plant has been moved from its location on the townsite to a point near the Eska mine opening and a 25-hp. boiler added, giving a power capacity large enough to care for all lights and operate the three fans, which are steam-driven. The high-line grade has been ballasted and the cleaning plant completed.

The general structure at Eska is synclinal although there are faults parallel to and at various angles to the axis of the syncline which obscure much of the structural detail. The surface of the area under consideration slopes gently toward the south, the waters of Eska Creek, which drop approximately 400 ft. in three miles, cutting a valley from 20 to 200 ft. below the general level of the ground. As the coal measures were folded and broken long before the formation of the present topography, the beds are not parallel to the surface. They appear in the bluffs which form the sides of the creek as a series of rather distorted semi-circles, one above another, the lower portion of the arms being concealed by the débris on the bank and in the creek bottom.

There is no doubt that the drainage of this field has followed, in many instances, the lines of least resistance created by fault zones and it therefore follows that the pioneer mining which has naturally started upon the outcrops exposed by stream valleys will, in general, be in the most disturbed portions of the district. A particular example of this can be noted on the Shaw East or Emery maps where the overlying Emery bed has been thrown down opposite the Shaw and Eska. Here the Shaw and Eska on the west side of the fault dip about 45 deg. while the portion of the Emery opposite them is nearer the center of the syncline and has a dip of about 10 deg. On a map showing the surface topography it can be noticed that a small stream follows the approximate course of this fault. Toward the westward the structure seems to be more regular and probably attains its maximum uniformity under the Eska conglomerate.

The prospecting has consisted of churn drilling, open-cutting, driving a few crosscuts and sinking some shallow test pits. At the face of the Maitland the bed was cut off by a fault when the property was taken over by the Commission, so this entry was driven through the fault in an effort to locate the coal. When the entry had passed through the break it was noted that the movement of the ground had been such as to throw the extension of the bed east of the fault above the entry. The surface above this point, and to the eastward, was laid off in 200-ft. squares, and churn drilling started in an effort to locate the extension of this bed and obtain accurate information regarding the structure. Some 35 holes were sunk, the total drilling amounting to about 2300 ft. The results thus obtained were plotted on plates of glass which represented planes at right angles to the strata. The ground, however, was too irregular to draw accurate conclusions from the results of the drilling, although several coal beds

VIEW OF SURFACE PLANT AT CHICKALOON

were intersected which will be prospected later from the David workings. The drilling was difficult owing to the large number of boulders, and with the light rig used it was impossible to attain a depth much over 175 ft. The greater portion of the time the holes were much under that figure.

On the southern limb of the syncline the outcrops of the Maitland, Emery and David have been exposed on the east bank of the creek, and on the west bank the outcrops of the same beds have been opened on the northern limb of the syncline.

A prospect shaft about 50 ft. deep and crosscut just north of the townsite, which were driven to check some of the drill holes, opened the Shaw bed on the southern limb of the syncline, while several unnamed beds to the westward have been exposed by open cuts along the creek banks.

Inasmuch as there are six different beds all of different thickness under exploration at Eska, and as the dip varies from 10 deg. to 60 deg., no one method

*Reprinted from *Alaska Railroad Record*, Vol. III, No. 20.

TYPES OF COTTAGES AT ESKA COAL MINES

of extraction can be applied to the entire series. However, all the coal so far produced has been recovered by the room-and-pillar method, the room width, in general, being 20 ft. with 30-ft. pillars between. There have been slight variations to this rule occasionally, due to the faulted or broken condition of the ground. All of the rooms are run on sights, and where the beds are parallel the pillars of the upper beds are kept vertically over those of the lower.

In new developments the practice is to drive the main haulageway and airway on the coal, the airway being about 30 ft. above the entry. An 8-ft. chute, 4 ft. of which is used for a manway, is driven every 50 ft. to connect the entry and airway, providing for ventilation and supplying storage room for the coal.

The rooms are turned off the airway opposite each chute. For 15 ft. they are driven up 8 ft. wide and then widened to 20 ft., at which measurement they are driven to the boundary.

The standard entry is 6 ft. wide at the top, 9 at the bottom, and 6½ above the rail. These measurements are in the clear.

Round timbers are used on the entries with 2 x 6 sawed lagging, the sets being placed on 6-ft. centers. In the rooms and pillars split cottonwood posts are used and have proved very satisfactory.

No coal is shot off the solid, but is undermined or cut at one side of the room before any shots are fired. The room-and-pillar method, with the rooms driven straight up the pitch, was adopted because the demand for coal was acute and this offered the greatest immediate supply. At some future date it will be possible to experiment with other methods, although the recovery so far has been excellent; and it is doubtful if any other method would give as satisfactory results, as the system is flexible and lends itself readily to the varying conditions met underground.

The methods of handling the coal from the face to the entry vary according to the thickness of the coal and the dip of the bed. When the pitch is steep enough for the coal to run on sheet iron, a chute is carried up the room with a manway and the coal is drawn from the chute into mine cars on the entry. Where the dip is low and the beds thin, small mine cars are installed to save brushing top or bottom. A sheave with a brake is fastened near the face of the room, a double track laid from the switch on the entry, and the weight of the loads used to pull the empties to the face. At several points where the dip is variable, a combination of the two systems is necessary, the small mine cars being emptied into a large loading chute on the counter and the coal transferred to larger cars on the main entry.

Owing to the excessive cold and the resulting difficulty of keeping the tracks underground free from ice during the winter months, the main haulageways have been made the return airways. During the winter of 1917-18 the only fans available were too small to overcome the natural draft, the result being that the cold air entering the main haulageway froze the water in the chutes and along the tracks. This lessened the production and practically doubled the cost of operation.

To ventilate the west side of the mine a 200-ft. crosscut was driven which intersected the main haulageway about 150 ft. from the portal. Two doors were placed on the haulageway between its portal and the intersection with the crosscut and a 3 x 2-ft. Jeffrey all-steel, double inlet, exhaust, reversible fan erected at the portal of the crosscut.

During the winter the air is taken in the counter gangway and distributed by three splits to the Eska, Shaw and Martin beds. This raises the temperature of the air considerably above the freezing point and keeps the temperature along the main workings fairly constant both winter and summer. The water is drained to a sump in the crosscut near the fan and the exhaust from the fan engine turned into the sump. This raises the temperature of the water to a point where it can be conducted to the outside without danger of freezing the drain boxes. The fan is driven by a 5 x 5-in. engine taken from an old Star drill, and under the present conditions has a capacity of about 15,000 cu.ft. of free air per minute. During the summer the air is admitted to the workings by chutes driven to the surface, the natural ventilation acting directly with the fan.

On the east side of the creek the old Shaw entry was extended to the surface and a 4 x 2½-ft. Jeffrey, all-steel, double-inlet, exhaust, reversible fan erected at its portal to ventilate the Emery, David and possibly a portion of the Maitland workings. The air for the David will be taken through the David airway and for the Emery through the Shaw counter. The fan is driven by a 6 x 7-in. vertical engine and has a rated capacity of 50,000 cu.ft. of free air per minute.

The Maitland is ventilated through a back entry on the coal which taps the main haulageway about 50 ft. from the portal, the intake air coming into the

VIEW OF SURFACE PLANT AT ESKA

mine through room No. 5, which is open to the surface. The air current is produced by a Western Blower Co. fan, which has a 24-in. intake, driven by a 5 x 5-in. engine taken from an old Star drill. This has a capacity of about 2000 cu.ft. of air per minute during the winter when conditions are most severe. The arrangements as regards drainage in the Maitland and Eska east drifts are similar to those on the west side, and all the fans are fitted with explosion doors.

During the summer a 20 x 40-ft. building was erected for a power plant near the mine entrance on the east side of the creek. The electric lighting plant which was formerly situated on the townsite was moved to the new building and a duplicate boiler added. The plant now contains two 42-in. vertical boilers which furnish steam for the fan and dynamo engines. The electric lighting equipment consists of a 15-kw. generator belted to a 7 x 8-in. Clark engine, the current being distributed at a pressure of 220 volts.

The coal from the mine is hauled over a highline some distance to the cleaning plant, where it passes over a ¾-in. grizzly to a picking table. As the grizzly did not remove all the undersize a 3-ft. section of ¾-in. slotted screen was set in the upper end of the table to take out the balance. The coal chutes are so arranged that the under and over-size may be loaded in the same or separate cars according to the use to which the fuel is to be put. As the coal is quite friable the undersize is the purer of the two products before the lump is cleaned and makes a good grade of fuel for power-plant work. It could be considerably improved by washing, but the present developments do not warrant the expense of installing such a plant.

During the year the Martin and Eska west entries have each been driven over a thousand feet and chutes raised from the Martin entry to the Shaw counter. From the Eska east a connection has been made with the Emery east on the northern limb of the syncline and a crosscut started that will tap the David in the same relative position. The latter beds are parallel to and underlie the Maitland. On the east bank of the creek the outcrops of the Maitland, David and Emery have been pinched up on the southern limb of the syncline, and on the west bank the same beds have been found on the northern limb. The outcrops of the Eska and several unknown beds have been picked up to the south and west, but as the extent of those beds has not been determined, the available tonnage cannot be estimated.

Considering only those areas that are above the present levels, there was on Jan. 1, 1918, approximately 22,000 short tons of coal available. During the year the commission has mined some 56,000 tons and on Jan. 1, 1919, there were 145,000 tons available for mining from the present openings.

The system of cost accounting is exact and comparatively simple. All material coming to the mine, whether from the main commission store or from private contractors, as the mine timbers are secured, is charged into a mine stores account. The storekeeper is directly responsible for all material and equipment, and issues the same only on the requisition from proper authority, such requisition showing where the material is used. All the material used is charged from the mine stores account direct against the place where it is used. All explosives are distributed to the place of use and record made of the same by a licensed powderman who reports such distribution daily. All material and equipment used must be requisitioned and a daily report of its use made by the foreman in immediate charge of the work.

With the exception of monthly bills from other departments the exact distribution of costs is obtained daily and is so arranged as to show at any time the material and labor entering any job, its progress at any date, and its present status.

SHAFT ENTRANCE OF THE ALASKA ENGINEERING COMMISSION MINE AT CHICKALOON

During the year there have been eight slight, five serious and no fatal accidents. There were approximately 57,000 man-shifts worked both surface and underground. The time lost due to accidents amounted to 30½ shifts for the slight accidents and 148 shifts for the serious.

At the time of the influenza epidemic one of the bunkhouses was converted into a temporary hospital. There were 55 cases, three of which developed into pneumonia and resulted in the death of those afflicted.

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ALL HOISTING ENGINEERS are familiar with the stretching which takes place in new wire ropes on slopes and shafts, and the reason is obvious. A bundle of spiral springs will stretch much more than would a bundle of the same number and size of straight wires. Under tension these springs stretch out. This action is interfered with somewhat on account of the wires and strands being tightly twisted together. However, if the core is of hemp the strands press down upon this elastic center and the rope stretches more or less. There is no special objection to this, for the engineer recognizes that it takes place and changes the landing marks on his rope or dial accordingly.

# Preparation of Bituminous Coal—I

By Ernst Prochaska
Benton, Illinois

SYNOPSIS—*Coal must be sold for more than it costs to produce, else the producer goes out of business. Preparation either raises the selling price or increases sales. Many types of preparation plants have been tried, some with success and others without it. For best results it would appear that final screening should be done after washing.*

THE existence of every coal mine depends solely upon the selling price of its product exceeding the cost of production. It may be feasible to operate a washery or a screening plant in connection with a coal mine if the better price obtained for the cleaner coal equals the cost of operation; or these plants may be operated at a loss, if thereby part of the mine output can be made salable or its sales increased.

Under the last named conditions, however, the preparing plant is only a necessary evil put in to satisfy the consumers. The management will be inclined therefore to make this plant as small and as simple as possible. If, however, the difference between the selling prices of raw coal and prepared coal is greater than the cost of preparation, the preparation equipment is coöperating with the mine to get a bigger profit for the whole mining plant; and the management will energetically use every effort to improve the method of preparation, to increase the difference between cost and selling price by decreasing the cost of preparation and by producing a high-grade prepared coal.

## Early Preparation Plants Forced Upon Operators

The foregoing facts are now well known, but it took a long time before the coal industry was fully convinced. The first preparation plants were not installed for the purpose of increasing the profits of a mine but were forced upon the coal industry by the demands of the consumers for a better product. The first demands for cleaner coal were made by the blast-furnace men who wanted a coke with less ash. This demand for a cleaner coal was restricted to comparatively few localities, and it was only after it had been thoroughly demonstrated that the greatest benefit accruing from coal preparation lay in the possibility of increasing the value of the coal and thereby the selling price far above the cost of preparation, that the coal industry took hold of this problem.

Besides the visible advantage of a larger profit, the economic question of the fuel supply commenced to be understood. It was plainly visible that a properly functioning separation plant could permit the mining of a coal bed, the coal from which on account of its large percentage of impurities could not be sold in the raw state. The experience with coal-preparing plants has established the following maxims:

1. The preparation of coal shall, by the cleaning of the raw material and the production of suitable and well screened sizes, secure a maximum price per ton of output.

2. To arrive at this result three points must be kept in view: (a) Highest possible purity of coal; (b) smallest possible loss of coal; (c) small cost of production.

3. As the foregoing three demands are conflicting, it will be necessary for the proper and economical installation of a preparation plant to find in each case the best relation between the three factors.

The maxim of loading the coal as clean as possible has been known and practiced to a greater or less extent since coal has been mined. As early as the first quarter of the last century slate was picked out of the coal in the mine and gobbed. The miners' wages were adjusted according to the purity of the coal loaded, and docking has been in use for the last 50 years.

Dry separation is usually accomplished with screens and the methods of screening can be separated into two groups: The first deals with screens for the purpose of making lump coal and screenings only; the second deals with screens that classify the product into lump, egg, nut and different sizes of screenings. The first group belongs solely to the dry separation process, whereas the second group belongs to it only if all the coal is prepared in a dry state. If a washery is connected with the mine the classification screens belong properly to the washing plant.

## Mechanical Preparation of Fine Coal

At present the preparation of the fine coal is carried on with water, and mostly in jigs. But in the beginning many processes were devised to avoid the use of water, and even now many inventors are working on the solution of a dry separation process. The wet separation always has had a decided advantage.

Before we enter into the description of this process we must consider the development of the classification of fine coal. Two different opinions in regard to the proper way of carrying on screening has always existed: (1) Screening from coarse to fine and (2) screening from fine to coarse. There also exists the question of whether it is better to screen before washing or to wash first and then screen.

In the beginning screening from fine to coarse was preferred. It was the shortest method and had the advantage that the dust was removed on the first screen plate, or that having the smallest perforations. But it had the drawback that the fine screens wore out quickly on account of the large mass of coal passing over them, and furthermore this large mass of big coal did not permit perfect screening. Both these disadvantages became greater as the quantities to be handled increased. In the sixties of the last century the practice reversed itself completely and most screening was done with concentric revolving screens. This method, however, did not remain long in actual practice. The demand was for a method of screening that would give output, durability and simplicity combined. These three demands were fulfilled by the shaking screen and later by the vibrating screen.

As long as jigging was performed on hand jigs nobody thought about classifying the coal. This, however, was not because the operator was convinced of the cor-

rectness of his method, but because at that time only the simplest and cheapest pieces of apparatus were used. Later on, after the jigs were improved, it was found that the separation was not particularly close and lack of sizing was blamed therefor. Since in ore dressing plants close classification was considered necessary, this was followed also in the coal washeries.

At first this was carried too far, and even the fine coal was divided into three or four sizes. But later on it was found that this close sizing produced too tight a bed in the jigs and it became necessary to mix in some nut coal. Nevertheless sizing apparatus remained a part of the equipment of every washery. The screening of the coal, however, was troublesome and made the washery complicated. Later on the coal was not so closely sized and some washeries were built to treat unsized material. The demand for well-screened washed coal, however, made it necessary to screen the coal after washing and consequently the coal was only screened into two sizes before wet treatment. Baum was the first to use the slogan "Washing before screening." Stewart also washed coal from 3 in. in diameter down without further sizing. In fact the great majority of coal washeries in America are washing unsized coal.

The knowledge gained by past experience can be condensed into the following paragraphs:

The jigging of bituminous coal can be carried on successfully without preparatory sizing.

Experience has shown that the separate washing of the fines facilitates the washing process and gives slightly better results. It has been proved, however, that coal finer than 20 mesh can not be improved by washing and should, if low enough in ash, be mixed with the washed coal; or if too high in ash used for other purposes.

The advisability of sizing the larger pieces of coal before washing must be judged for each installation separately.

To produce a perfectly sized washed coal screening after washing is necessary.

The whole question, where favorable raw coal is involved, it not of decided importance. It must be determined in most cases by considering the cost of installation and operation, the space required and at disposal, and the most suitable general arrangement of the plant.

### Washing of Coal

The following types of apparatus have been used for the washing of coal: Trough washers, ascending current washers, jigs with stationary and with moving screens, concentrating tables, air separators, centrifugal separators, separators using dense liquids, separators taking advantage of the different shapes of the particles, and chemical washers. The results obtained with these methods and types of apparatus can be summarized as follows:

Trough washers are only adapted for the very fine coal or for the removal of fireclay and mud.

Ascending current washers deserve the credit of having opened the eyes of the coal operators to the benefit derived from improving the coal by washing, but on account of low efficiency they have been supplanted by jigging which owing to its simplicity and satisfactory efficiency is far ahead of all other methods.

Tables are being used especially for the fine coal to good advantage, and the results obtained with them are highly satisfactory.

Air separators are important for the purpose of removing and collecting the dust.

Centrifugal separators can not compete with the other methods, but centrifugal force is used to some extent for the drying of coal.

Dense liquid separators have proved failures.

Separation according to the shape of particles is to be considered only in special cases. It can be used as a preparatory process.

Chemical washers have not been sufficiently tried out in actual practice, but they appear to be cumbersome and costly.

The products resulting from the foregoing operations, if wet processes only are considered, are washed coal from 3 in. down and dirty wash water containing fireclay and sludge. It always has been clear that both of these products need further treatment before they can be used to the fullest advantage. The washed coal must be dewatered and the wash water must be clarified and the sludge removed. This clarification must be carried on to such an extent that the water can be either returned into the system to be used over again or that it can be let run away without polluting streams and natural water courses.

### Dewatering of the Washed Coal

The dewatering of the larger sizes of washed coal is comparatively simple and easy. It is usually carried out on dewatering elevators, which are used to elevate the washed coal into the loading bins. Further dewatering is also carried on on the screens that are employed to size the washed coal.

The dewatering, or rather drying, of the fine coal is a much more difficult problem. Fine coal if wet forms a dense, compact mass which contains too much water for use in either coke ovens or boiler furnaces. The wet coal has also the further disadvantage of freezing solid in the winter time. The excess water increases the weight of the coal and most consumers object to paying coal prices for moisture. The drying of the fine coal has for a long time been a sore point, and even now it presents great difficulties. For this reason it was proposed to screen out all coal below $\frac{1}{8}$ in. and mix the raw fines with the washed fuel.

This method offers the simplest solution of the difficult drying problem, but can only be used if the ash and sulphur content of the washed coal are thereby not materially increased. This, however, is hardly to be expected, as no material improvement can be accomplished by washing fines below 10 mesh. If, however, the addition of the raw fines should increase the ash and sulphur in the washed coal above a desired amount, it would be better to load the fines in the raw state, or to use them for fuel purposes.

There are at present four methods of drying coal particles smaller than $\frac{1}{2}$ in. in diameter: Dewatering pits, centrifugal dryers, heat dryers and filters.

Dewatering pits have been used to some extent. They required considerable ground space, are costly to install, and the operation expenses are also rather high. The dewatering of the coal is only effective to a certain depth, as the material in the lower portion of the pits acts as a filter bed and must in some instances be removed and rewashed.

Centrifugal dryers are at present the most satisfactory apparatus with which to dewater coal. The operating costs are reasonable and the coal is dewatered to a fairly satisfactory degree. The only objection to this

type of dryer lies in the fact that it produces too much sludge. This requires additional apparatus for its recovery.

Drying by heat can not be considered on account of the high cost for fuel.

Filtering can only be considered for very fine coal and sludge. It should, however, give good results. Up to the present time no extensive filtering plants have been installed in any of the coal washeries.

*(To be continued)*

## Some Items That Enter Into the Cost of Producing Coal

The many little factors that enter into the cost of producing and marketing coal have been rather clearly defined during the last few years. As a result of investigations made by the Fuel Administration, the operators, during the war period, were obliged to submit itemized monthly reports of the tonnage and cost of producing the coal shipped from their respective mines. The major part of the expense in producing coal is incurred in mining, haulage, pumping, ventilation, timbering and supplies. It is with the item of supplies that this article will deal.

The Victor American Fuel Co., with eight producing mines in the State of Colorado, submitted a statement recently showing some of its sundry expenditures during the year 1918. This company produced 1,142,891 tons of coal last year, which is about one-tenth of the total tonnage of the state. Machine-mining has not progressed to the same extent in Colorado as it has in other states. The company in question in 1917 mined around 700,000 tons of coal by hand and 200,000 by machine. The Victor-American operations using hand mining exclusively in 1917 were Ravenwood, Bowen, Gray Creek and Wadge; those mining largely by hand were Delagua and Pinnacle, and those mining largely by machine were Chandler and Radiant.

This company used 130 horses and mules, 28 electric motors and 20 electric mining machines in the year 1918. The total capacity of the eight mines is 6250 tons per day, and the largest producer of the group is Delagua, with 2500 tons; Pinnacle follows with a capacity of 1000 tons. The tonnage of the various plants for 1918 is as follows: Delagua, 555,688; Chandler, 177,013; Pinnacle, 130,143; Bowen, 102,143; Ravenwood, 58,876; Radiant, 43,474; Wadge, 40,004, and Gray Creek, 35,549. All these mines are nongaseous. Chandler is a shaft mine, the seam being 461 ft. below the surface; the other plants are either slope or drift operations. In 1917 this company had 916 inside employees.

The Victor-American statement referred to distributes certain expenditures for its eight operations under 36 items. The accompanying table gives a selected list of these items. The figures in the table represent these items reduced to a cost-per-ton basis of the coal produced at each mine in 1918. As local causes affect such costs, a better plan would be to give an average covering several years. For instance, in a certain year enough rail may be purchased to nearly last during the following year. Such matters as hay and oats also may vary somewhat; thus at Delagua, a greater number of mules are used for haulage than at mines like Pinnacle and Wadge, where so much of the haulage is mechanical.

Operators should find this table interesting for comparison with their own costs, making due allowance for differences of coal field and section of country. The statements made as to the equipment of the various mines and their capacity should throw quite some light on the subject. Where there is considerable variation in the cost per ton for the same item among the several mines, there is a special reason for it. Thus, in the case of mine timber and ties, the cost varies all the way from 3½c. to 27c. per ton of coal produced. Unless there was an unusual or temporary demand for the excessive use of timber at some mine, we would expect to account for this irregularity by the fact that large quantities of timber and ties had been purchased looking ahead to future requirements. Similarly in the case of rails and fastenings. In this connection custom differs among operators. Some companies charge up the full amount of a big purchase of equipment at the time the bill was settled, thus cleaning up the account at once. Others distribute the cost of such purchases over a greater or less period of time. By this latter method the monthly cost sheets do not show such wide variation in the cost of producing coal. They more nearly represent the true condition of affairs.

There is also considerable difference in the totals of the cost of supplies per ton of coal at the various mines, the average being $0.2295 for the eight mines. In five of the operations the total runs from 10½ to 17 or 18c., which would seem to give a fair idea of the cost per ton of coal produced for the items charged.

SOME ITEMS ENTERING INTO THE COST OF PRODUCING COAL AT THE MINES OF THE VICTOR-AMERICAN FUEL CO.
(Costs reduced to cents per ton of production for 1918)

| Items | Gray Creek | Delagua | Bowen | Ravenwood | Chandler | Radiant | Pinnacle | Wadge |
|---|---|---|---|---|---|---|---|---|
| Babbitt | $0.0019 | $0.0008 | $0.0003 | ..... | $0.0003 | ..... | $0.0003 | $0.0010 |
| Belting (rubber) | .0012 | .0001 | .0020 | $0.0001 | .0002 | ..... | .0004 | .0036 |
| Belting (leather) | ..... | .0002 | .0805 | ..... | .0002 | ..... | ..... | ..... |
| Bolts (carriage and machine) | .0053 | .0023 | .0036 | .0012 | .0043 | $0.0017 | .0028 | .0083 |
| Cars and repairs (mine) | .0014 | .0114 | .0088 | .0012 | .0142 | .0066 | .0123 | .0240 |
| Car door (boards) | .0060 | .0004 | .0026 | .0040 | .0017 | .0054 | .0023 | .0058 |
| Cement | .0031 | .0007 | .0049 | .0013 | .0053 | .0026 | .0031 | .0258 |
| Brattice (lumber) | .0038 | .0015 | .0037 | .0054 | .0067 | .0181 | .0023 | ..... |
| Drills (twist) | .0011 | .0002 | .0003 | .00001 | .0002 | .0003 | .0002 | .0005 |
| Harness supplies | .0012 | .0016 | .0018 | .0007 | .0016 | .0028 | .0003 | .0016 |
| Hay and alfalfa | .0470 | .0061 | .0100 | .0125 | .0043 | .0253 | .0062 | .0126 |
| Lamps (carbon) | .0017 | .0004 | .0007 | .0002 | .0005 | .0005 | .0003 | .0010 |
| Lamps (Mazda) | .0001 | .0001 | .0001 | ..... | .0002 | ..... | .0006 | .0005 |
| Lamps (Edison-mine) | ..... | ..... | ..... | ..... | .0010 | ..... | ..... | ..... |
| Machine repair parts | ..... | .0018 | .0027 | .0063 | .0094 | .0434 | ..... | .0121 |
| Oats | .0185 | .0136 | .0098 | .0327 | .0182 | .0344 | .0013 | .0190 |
| Packing | .0003 | .0001 | .0003 | .0004 | .0008 | ..... | .0108 | .0049 |
| Pipe and fittings | .0149 | .0013 | .0062 | .0003 | .0057 | .0025 | .0008 | .0470 |
| Mine timber and ties | .0660 | .1096 | .0334 | .1698 | .0891 | .2711 | .0 99 | .0489 |
| Nails and fastenings | .0018 | .0157 | .0036 | .0356 | .0009 | .0719 | .0292 | .1137 |
| Shovels | ..... | .00004 | ..... | ..... | ..... | .0002 | .0003 | .00005 |
| Valves | ..... | .0004 | ..... | .0003 | .0007 | .0011 | .0020 | .0113 |
| Waste | .0016 | .0004 | .0004 | .0003 | .0008 | ..... | .0004 | .0009 |
| Totals | $0.1769 | $0.1687 | $0.1057 | $0.2723 | $0.1665 | $0.4879 | $0.0158 | $0.3425 |

# The Future of Peat as a Fuel—II

By J. B. C. Kershaw
Colwyn Bay, North Wales

SYNOPSIS—*Raw peat, even when commercially dry, is hardly a satisfactory fuel for power purposes. Various methods have been employed for carbonizing and gasifying this fuel, in efforts more or less successful; one successful method of burning peat so far as steam generation is concerned is by powdering it and burning the powder in suspension. Gasification and powdering appear to be the routes of improvement along which may be expected the greatest future progress in peat utilization.*

MANY processes have been devised and patented for carbonizing peat in closed retorts or ovens, the aim being to obtain a more condensed and marketable form of fuel than is obtained by briquetting, or by machine treatment of the raw peat. In these processes the air-dried machine-treated peat, obtained as described in Article I, is employed as the raw material for a further process of enrichment, artificial heat being employed to drive off the remaining moisture and some of the hydrocarbon gases.

None of these processes has yet obtained general application, for the simple reason that, in the majority of cases, the increase in the calorific value of the chief product—peat coke—and the value of the recovered byproducts is not sufficient to cover the cost of the additional treatment. Under special conditions as regards the market for peat coke, and for the creosote, light oils, acetate of lime and other byproducts, the peat-carbonizing processes can be worked successfully, however, and both in Norway and Germany there are installations of this type in actual operation. The processes are distinguished as "dry" or "wet" carbonization processes according to whether dry heat or superheated steam is employed.

The Jebson process of dry carbonization is based upon the application of electrically produced heat and was first worked upon an industrial scale in the years 1901-1902, near Bergen, in Norway. So far as I am aware it is still employed at this place, but it does not appear to have made headway in any other locality.

The peat, dried as far as possible by the sun and air, is molded into suitably shaped blocks and is placed in retorts the walls of which are covered with asbestos or other non-conducting material unacted upon by the gases which are produced when the peat is heated. The charge of peat is then raised to 450 deg. C. (842 deg. F.) by means of electric resistance coils placed inside the retort in contact with the raw peat, so that the heat produced in them is transmitted directly to the charge, without any losses by convection or radiation.

By this means some of the difficulties of heating the charge of peat are overcome but the method is applicable only where electric power is available at a low cost, as is the case in Norway. The gas produced is used to dry the blocks of peat before they are placed in the retort, in a long heating chamber operated upon the countercurrent principle. The tar obtained is worked up for the usual byproducts of the peat-coking process.

The Ziegler method of carbonizing peat in closed retorts was brought out by Dr. M. Ziegler in 1892, and has been worked successfully since that year at several localities in Germany and Russia. The peat in this case is carbonized by the application of artificial heat, obtained by burning the gas given off from the retorts. Where the process is most successfully operated the surplus gas suffices to generate power for operating the dredging and pulping machines by aid of which the peat is won from the bog, while the waste heat of the gas which passes away from the retorts is also utilized to dry the peat blocks before carbonizing.

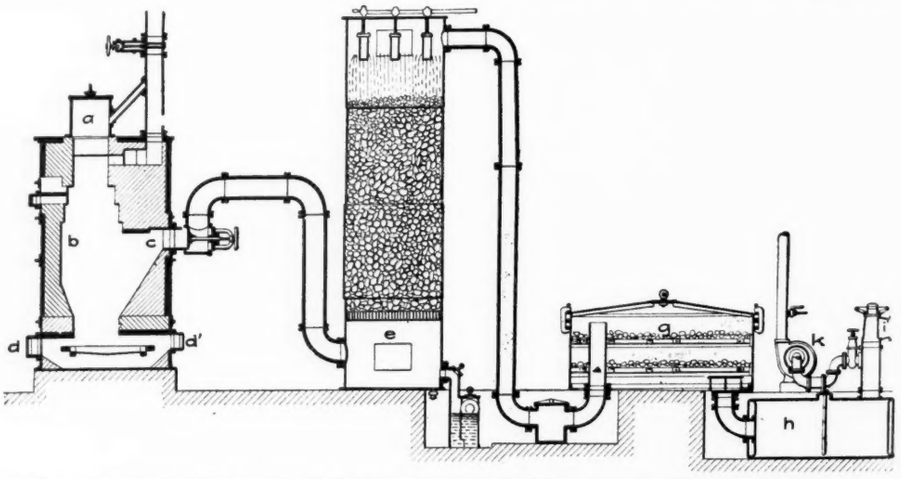



FIG. 7. SECTIONAL ELEVATION OF PEAT GAS PRODUCER, SCRUBBER, DRIER AND FAN—GAS OUTLET AT SIDE OF PRODUCER

As regards the output of solid fuel by the dry coking process, about one-third of the weight of the raw peat charged into the retorts is obtained as a "peat coke," specially suitable for blacksmithing and metallurgical work, on account of its low content of sulphur and ash. According to an estimate made by Dr. Ziegler, the yield of byproducts from a plant coking 100 tons of air-dried machine peat each 24 hours will be as follows: Creosote oil, 3100 lb.; acetate of lime, 1320 lb.; sulphate of ammonia, 900 lb.; paraffin wax, 715 lb.; pitch, 440 lb.; light oils, 280 gal.; heavy oils, 95 gal.; methyl alcohol, 65 gal.

This estimate, however, is only correct for the peat found in the locality where the plant which gave this yield is situated, and it is important to note that the financial success of the Ziegler process is highly dependent upon the character and the purity of the peat charged into the retorts. The existence of good markets near at hand for the peat coke and byproducts of

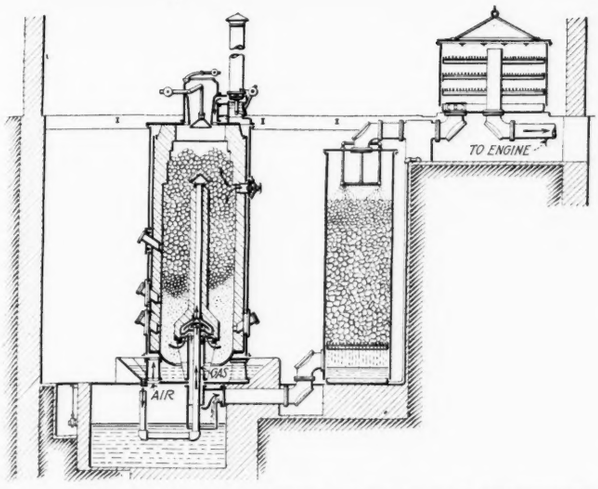



FIG. 8. SECTIONAL ELEVATION OF PEAT GAS PRODUCER, SCRUBBER AND DRIER—GAS OUTLET AT BOTTOM OF PRODUCER

the process is also a *sine qua non* of its successful operation. The Ziegler plants erected in Europe were at Oldenburg and Reuerberg, in Germany, and at Redleino, in Russia; but the last named is reported to have not achieved a permanent success, owing to lack of demand for the byproducts.

That the Germans are still devoting attention to the dry distillation of peat is shown by the fact that as recently as 1916 a patent was granted to Limbers (No. 302,322, Nov. 3, 1916), for an improved form of retort in which the heating is to be effected in three stages by means of heated non-oxidizing gases, which pass over and through the mass of fuel.

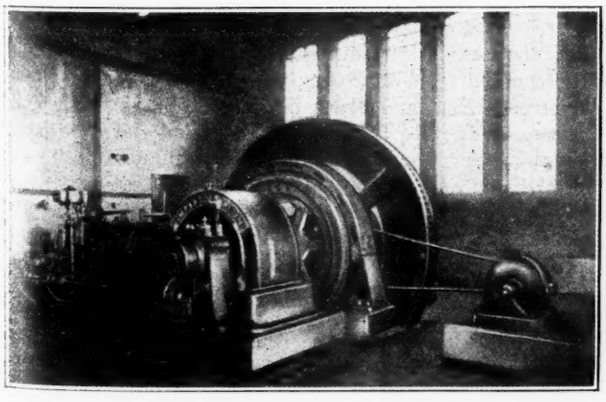
The "wet" carbonizing processes depend upon the use of superheated steam under considerable pressure for raising the temperature of the peat to 300 to 400 deg. F. It is doubtful if any real carbonization occurs at this temperature, and it is much more probable that the hardening effect of the treatment upon the peat is due to the breaking down of some portions of the cell structure, and to the fact that more of the water and moisture can be expelled afterward by mechanical pressure than is the case with ordinary machine peat.

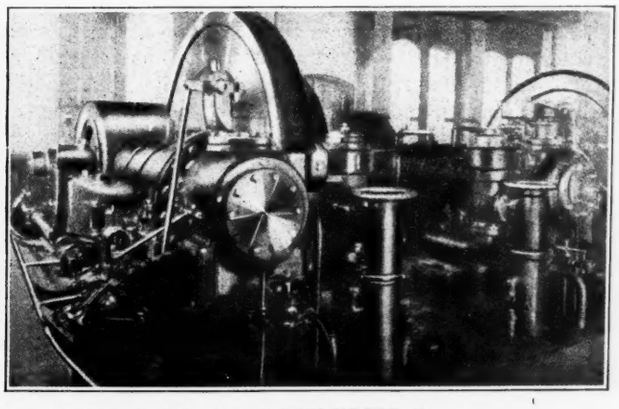
The most noteworthy of these processes of peat carbonization was the Ekenberg process, which was brought out in 1904 and was tried upon a working industrial scale in Sweden. The wet carbonizing furnaces used in the trials consisted of a series of iron pipes about 36 ft. long, through which the wet peat, in the form of finely divided pulp, was forced at a pressure of 150 lb. per square inch. Each tube was double, and the peat pulp after passing down the large outer tube returned along the inner smaller tube and thus gave up some of its heat to the incoming pulp. The outer tubes projected for half of their length into the firebox of the furnace and were heated here to the required temperature by coal or gas. Ekenberg claimed that this heating under pressure destroyed the cells of the slimy hydro-cellulose compounds, which inclosed a large proportion of the water contained in the peat, and that after submitting the material to his process the greater portion of the water could be expelled by mechanical pressure alone.

The water-free carbonized peat tested 11,000 B.t.u. per lb., and the cost of production was estimated to be from $1.60 to $2.10 per ton, according to whether machine or hand labor was employed for winning the peat from the bog. Although the Ekenberg process received an extended trial in Sweden, and was much discussed by engineers, having been the subject of a paper read by the inventor before the Iron and Steel Institute in 1909, I believe that it is not now in operation, the costs having proved excessive.

A modification of the process has, however, been introduced into France, and has been operated successfully in the development of the peat deposits at Ille-et-Vilaine. The following description of the process is taken from an article by Messrs. Galaine, Lenormand and Houlbert which appeared in *Comptes-Rendus*, of Sept. 3, 1917:

The peat is first treated in presses of the Mabille or Aurep type, which give a pressure of 710 to 1420 lb. per square inch and easily reduce the original water contents of from 80 or 90 to 60 per cent. The partially dried peat blocks, or turves, are then placed in a suitable carrier and are introduced into horizontal autoclaves, where they are heated by steam to 160 deg. C. (320 deg. F.) for a period of 25 minutes. On removal from the autoclaves the hot briquets may be a second time passed through the press, but this is not essential. They dry quickly in air down to 20 to 25 per cent. of water, but it is better to place them in a heated chamber for the final stage of the process. The final product is quite different in physical and chemical properties from briquets of ordinary peat, and the authors have given it the name of "tourbon." They regard it as a half-formed coke, and state that its heat value is about 13,000 B.t.u. per pound, or considerably higher than that of dried peat. As the hydro-cellulose compounds have





FIGS. 9 AND 10. VIEWS IN ENGINE ROOM OF PLANT SHOWN IN SECTION IN FIG. 7

been destroyed by the temperature attained in the autoclave, the product does not absorb more moisture after it is once dried.

An approximate analysis of the anhydrous *tourbon* obtained from the peat deposits of Châteauneuf, at Ille-et-Vilaine, gave the following figures: Volatile matter, 60.3 per cent.; fixed carbon, 36.6 per cent.; ash, 3.1 per cent.

By arranging the autoclaves in batteries, with suitable arrangements for making use of the heat of the exhaust steam, it is possible to carry out the process with an extremely high efficiency as regards utilization of the heat, the figures varying from 85 to 91 per cent.

Gas producers have been designed in recent years that can be operated quite successfully with solid fuels containing up to 35 per cent. of water, and this fact has led engineers to devote considerable attention to the possibilities of utilizing peat in gas producers. The fact that the low temperature obtaining in the producers favors the production and recovery of ammonia is another point in favor of the complete gasification of the peat, since the average nitrogen content of many peat bogs is higher than that of the ordinary coal measures. Many forms of special producer and plant for the gasification of peat and recovery of the ammonia have been patented and tried upon an industrial scale in Europe during the past decade. Before the war there were quite a large number of these peat-gas power plants in successful operation in Germany, Sweden, Russia, Austria, Italy and Ireland.

The type of gas producer that has proved most satisfactory with peat is that known as the double combustion-zone producer, the gaseous products that collect above the charge of fuel being drawn (or forced) downward through the incandescent carbonaceous matter, in order to decompose the larger portion of the tarry vapor contained in these gases before they are used in the engine. Practical tests have proved that more power is obtained by this simple gasification process than when byproduct recovery is carried out. The decision as to whether there will be any economic gain by separating the tar and recovering the ammonia must depend upon local conditions, the amount of nitrogen contained in the raw peat and the size of the plant.

Under the best conditions one ton of peat gasified in a double-zone, suction gas producer, and utilized for driving a modern gas engine, will yield the same amount of power at the engine shaft as one ton of good coal employed for steam raising and power generation in an up-to-date steam-driven power plant. In support of this statement the following figures are given, taken from an actual test carried out in Germany in 1911, with a 300-hp. suction gas producer and engine, using as fuel a peat testing 23.4 per cent. moisture, 4.2 per cent. ash and 7108 B.t.u. per pound.

The consumption of peat during the test was 207 kg. (4560 lb.) at full load and 1736 kg. (3820 lb.) at half load, the consumption per horsepower being 0.99 kg. (2.18 lb.) and 1.45 kg. (3.2 lb.) respectively. The gas obtained from the producer at full load tested as follows: H, 17.15 per cent; CO, 15.85 per cent.; O, 1.02 per cent.; $CO_2$, 12.34 per cent.; N, 52.2 per cent. The calorific value of the gas was 120.2 B.t.u. per cubic foot. Assuming the air-dried peat could be delivered into the producer from the bog at a cost of $1 per ton, the cost of fuel per kilowatt-hour in this plant was only 0.154c., which is a far lower figure than could be obtained with any other fuel.

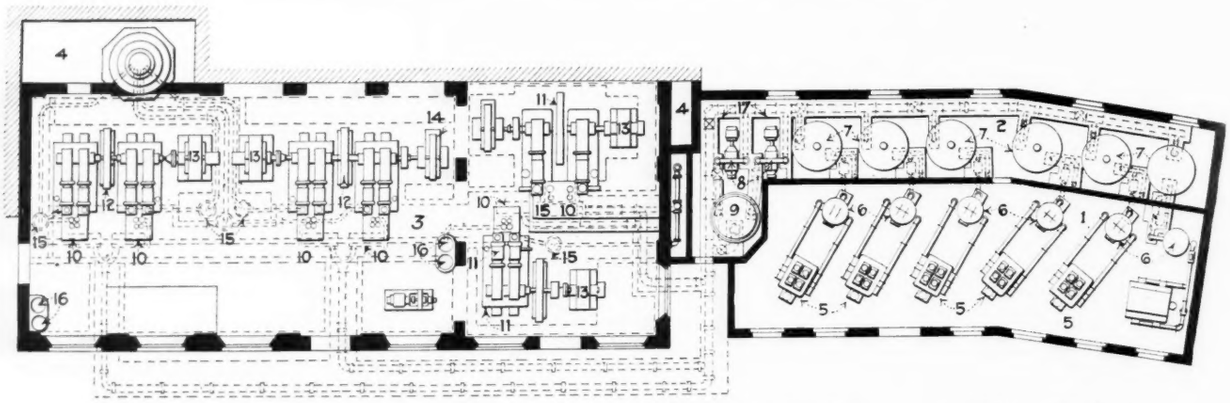



FIG. 11. PLAN OF ENLARGED POWER STATION AT VISBY, IN GOTHLAND, SWEDEN; GAS PRODUCER PLANT AT RIGHT, POWER PLANT AT LEFT

Some typical installations of peat-gas power plants will now be described. Fig. 7 shows a section of a peat gas producer with the gas outlet at the center of the producer. Fig. 8 shows one of the down-draft type with the gas exit at the bottom.

One of the earliest installations of a peat gas producer to be erected was that at Skabersjo, in Sweden. This plant was started in 1904 and enlarged in 1906 and, so far as I am aware, is still in operation. A large peat bog exists in this locality at a distance of only three miles from the town, which is supplied with electricity for heat and power purposes from the generating station at the bog. Fig. 7 is a sectional elevation of the producer, scrubber and fan, and Figs. 9 and 10 are views of the engine room. The original installation was designed to produce 150 hp. This proving to be quite successful, the plant was duplicated in 1906 and increased to 300-hp. capacity.

Only 750 tons of air-dried peat are required per annum to give this power, and there is consequently little difficulty in obtaining the peat from the bog, with the aid of the local farmers, during the working season, which in this locality lasts from Apr. 15 to Sept. 1. The power for working the dredger and pulping ma-

chine is obtained from a 35-hp. motor, supplied with electric current from the central generating station.

Two Koerting suction gas producers, specially designed for peat gasification, are installed at this station, with two 150-hp. Koerting gas engines of the twin horizontal single-acting type. These engines are direct-coupled to three-phase alternators which generate current at 3000 volts for transmission to the town of Skabersjo, where it is sold to consumers, for lighting purposes, at 9 cents per unit. The air-dried peat was delivered (before the war) to the producers at a cost of only $0.80 per ton, whereas bituminous coal at this place costs $3.80 per ton.

Another successful and larger peat-gas power installation, equipped with Koerting producers and engines, is in operation at the cement works situated at Visby, in Gothland. The original plant here was erected in 1908 and consisted of one 250-hp. producer and gas engine of the horizontal single-acting type, but in 1911 when Fernald[1] visited the plant, the equipment was being increased to 1500 hp. Fig. 11 shows the plan of the enlarged power station.

The peat-working season on the bog at Visby extends from Apr. 15 to Aug. 8, and all the peat required for the winter's use should be dry and in the storage bins by Oct. 1 of each year. The peat machine originally used in 1908 required 42 hp., and when worked with a squad of 10 men it produced 60 tons of "dry" peat per day of 10 hours. The term "dry," applied to this peat, was somewhat misleading, as it still contained 25 per cent. or more of water, according to the weather conditions prevailing when it was harvested.

With this machine the peat was excavated by a bucket dredger and conveyor, was passed through shredding and mixing devices, and was then delivered into the cars in a pasty mass. It was transported in this state to the drying fields and was dumped into a frame on the ground. It was finally rolled and divided into bricks by means of a bladed roller and a 3-in. disk cutter operated by a workman. This "dry" peat contained 25 to 40 per cent. moisture, and the bricks measured 8 to 10 in. in length, 4 in. in width and 2 in. in thickness, and weighed 1¾ lb. The cost of this peat when collected at the bog ready for delivery in cars to the gas producers, was $1.36 per ton.

*Ireland*—The most successful example of an industrial power-plant operated with peat, in Ireland, is that of Hamilton, Robb & Co., at Portadown, County Armagh. This plant has a capacity of 400 hp. and has been in continuous operation since 1911. The equipment consists of two Crossley gas producers, specially designed for the gasification of wet peat, and two Crossley gas engines. The peat is obtained from a bog 12 miles distant from Portadown, and after air drying is transported to the works by water carriage. The gas producers are worked on the suction principle, and no attempt is made to recover any byproducts, although scrubbers are employed to remove the tar that has escaped destruction in the producers. The composition of the gas is as follows: H, 18 per cent.; CO, 19 per cent.; $CH_4$, 1.6 per cent.; $CO_2$, 7 per cent.; N, 54 per cent. The calorific value of the gas is 140 B.t.u. per cubic foot. During a test run of six hour's duration, made in October, 1911, with a load of 250 hp., the consumption of peat amounted to 2.55 lb. per b.-hp.-hr. From these figures it is calculated that if peat were delivered at the producers at a total cost of $1.20 per ton, power could be generated at this plant with an expenditure for fuel of 0.124c. per b.-hp.-hr.

Some difficulties have been experienced at this Portadown plant with the tar, but by increasing the amount of wash water (used for cleansing the gas by spraying) to 7 gal. per b.-hp.-hr., this trouble has been overcome, and the engines can now be run for three weeks without cleaning the valves.

About 100 tons of peat tar are produced annually at the Portadown works. As no outlet has yet been found for it, the Swedish and German methods of converting it into gas would appear to be more advantageous, especially as, according to Pegg, 5 per cent. of the weight of the raw peat is recovered in this form. Figs. 12 and 13 are views of the producer plant at Portadown.

### Gasification with Recovery of the Ammonia

The peat-gas power plants described above are worked without recovery of the ammonia. It is now advantageous to consider whether better economic results could be obtained by adding an ammonium sulphate plant to an installation of producers and gas engines. In a paper read before the Liverpool section of the Society of Chemical Industry, in November, 1916, Professor Baly discussed this question at considerable length, and many of the figures that follow are taken from his paper. As an example of the amount of sulphate of ammonia that can be recovered from peat, the tests made with producers of the Mond type, at the works of the Power Gas Corporation at Stockton-on-Tees, may be quoted:

| | German Peat | Italian Peat | English Peat |
|---|---|---|---|
| Moisture content | 40 to 60 per cent. | 15 per cent. | 57.5 per cent. |
| Nitrogen content | 1 per cent. | 1.58 per cent. | 2.3 per cent. |
| Gas from one ton of theoretically dry peat | 35,000 cu.ft. | 60,000 cu.ft. | 90,000 cu.ft. |
| Heat value (B.t.u. per cu.ft.) | 150 | 166 | 134 |
| $(NH_2)_4SO_4$ per ton of theoretically dry peat | 70 lb. | 115 lb. | 215 lb. |

The German engineers, Frank & Caro, have devoted considerable attention to the problem of adapting the Mond producer to the gasification of peat, and a large installation of this modified type of the Mond gas producer was at work in northwestern Germany on the Schlweger bog before the war. Their method of overcoming the special difficulties caused by the use of peat containing 50 to 70 per cent. of moisture is to increase the temperature of the drying zone of the producer to 250 deg. C. (482 deg. F.). According to Baly, this increase gives an intensive combustion of the coke, an increase in the size and temperature of the combustion zone, and consequently an almost quantitative recovery of the nitrogen as ammonia.

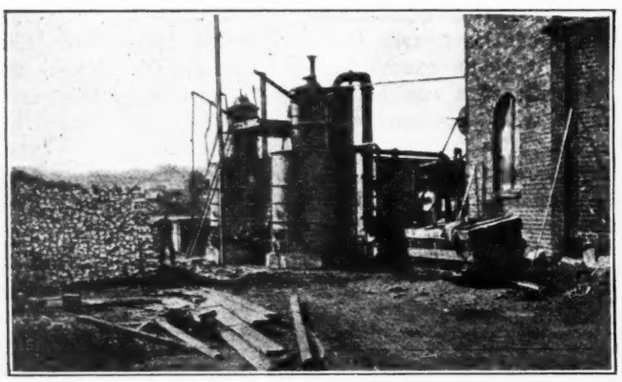
The total amount of steam used should not exceed, however, half the weight of the peat gasified. Baly gives the following figures, as typical of the results obtained with the Mond producer (as modified by Frank & Caro) when working on peat containing 50 to 60 per cent. of moisture. One ton of theoretically dry peat gives from 88,000 to 92,000 cu.ft. of gas. Of this total 39,000 cu.ft. is used in the producers for the air steam blast, leaving 49,000 to 53,000 cu.ft. as surplus. From this surplus gas 700 to 750 hp.-hr. can be developed The recovery of nitrogen as ammonia is from 70 to 85 per cent. of that contained in the fuel, and the yield of tar is from 3 to 6 per cent.

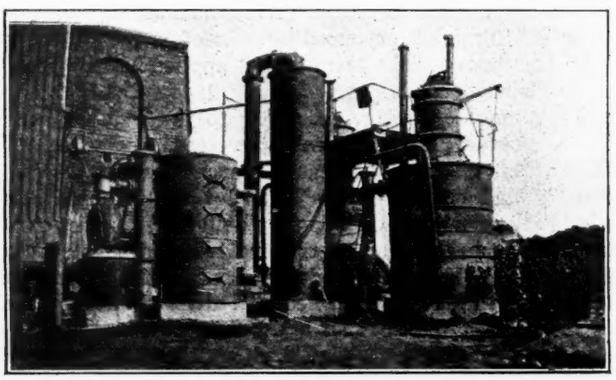
As regards the cost of power, Baly states that the

[1] "Producer Gas Power Plants—Developments in Europe." U. S. Bureau of Mines, Bulletin 4, 1911.

original figure given when the process was first brought before the public was 0.12c. per hp.-hr., but in 1911 figures were published for the Schlweger bog plant that showed that all the expenses were covered by the value of the recovered byproducts. At this date the capacity of the plant was 6000 kw., and each ton of theoretically dry peat produced 1000 hp.-hr. and 90 lb. of ammonium sulphate. Peat containing up to 70 per cent. of water was used in the producers. The tar obtained was distilled to secure paraffin wax and neutral oils.

A peat-gas power plant using a method similar to the modified Mond method of working is also in operation at Codigoro, in Italy. The peat, after preliminary drying and crushing, is charged into a producer 30 ft. high, having the combustion zone near the bottom. The combustion is regulated by a hot air and steam jet, and the plant is said to recover, as ammonium sulphate, three-fourths of the nitrogen in the raw peat, or 170 lb. per ton. The original plant treated 1500 cu.ft. of peat per day, and produced 50 tons of ammonium sulphate per month, with electrical energy equivalent to 800 hp. The plant has recently been enlarged, and according to the latest figures is now treating 17,000 tons of dried peat annually and producing 10 to 12 tons of ammonium sulphate per day.





FIGS. 12 AND 13. VIEWS OF PEAT GAS PRODUCER PLANT AT PORTADOWN, COUNTY ARMAGH, IRELAND

Although powdered peat has not been long before the public as fuel for steam-raising purposes, many engineers, including myself, believe that this method of utilizing this fuel will expand rapidly, and that it will take the place of the older method of briquetting the peat before burning it for power purposes. The advantages claimed for powdered peat are that it is easily produced and that it burns with an intensely hot flame, owing to its high percentage of volatile matter.

The method of producing peat powder varies In Sweden the peat is dug, machined, spread on the bog to dry and cut into bricks, in the manner customary for briquetting. The air-dried bricks contain 50 per cent. of water, and are crushed to a coarse powder in specially built machines. This powder is then dried in rotary dryers. In Canada a novel system of collecting peat powder has been tried, based on the use of pneumatic collecting machines. The cleared and smooth surface of the bog is lightly scored by a harrow, and after a few hours' exposure to wind and sunshine the thin layer of peat powder becomes dried down to 30 per cent., or less, of moisture. This dried dust is then collected by air suction, the collector being operated electrically and mounted on rails.

A collector of this type can gather (on a favorable day) 40 to 50 tons of air-dried peat, at a cost of only $1.44 per ton. After screening, the moisture content, if desired, can be still further reduced by artificial drying.

A further advantage of peat powder as a fuel is that it can be handled and transported more cheaply than briquets, when employed for steam-raising purposes. There is said to be no danger from self-ignition, although this seems doubtful.

The only figures covering the efficiency of peat powder as a fuel are those published by Ekelund, who stated that 1.2 tons of peat powder, containing 15 per cent. of water, was equal in evaporative effect to one ton of the best coal. The cost of producing peat powder in Sweden, in 1911, was given as $2.06 per ton.

In 1913, or just before the war, the Finnish Government made a grant of $48,000 to the Turf Fuel Co. to aid it in erecting a factory for the production of "dust peat" near the railway station at Rychimyaki. This arrangement was based on the experience gained on the Stockholm-Rimbosk Ry., in Sweden, on which line the locomotives since 1911 had been worked with the new form of fuel. The war of course stopped these contemplated developments in Finland, but there will now be a considerable expansion of the powdered-peat industry in Scandinavia, northern Russia, Canada and other countries, where the climatic conditions are favorable.

For large central stations for electric-power generation the production of gas from the partially dried peat in gas producers of the double combustion-zone type and the use of this gas in large gas engines is certainly the most economical and practical method of utilizing the peat.

For steam generation and the heating of large furnaces generally the use of powdered peat offers many advantages over the briquetted form of the fuel, in addition to the greater cheapness of production. Therefore, in those countries where the surface of the bogs and the climatic conditions favor the production of peat powder, developments for producing this form of the fuel in large quantities may be expected to occur.

For domestic heating purposes the machine-made brick or briquet is the cheapest, and I do not believe that the more elaborate processes used to produce a peat coke, or *tourbon*, will be found to pay their working expenses in those districts where peat must be sold in competition with coal.

The author's thanks are due to the Acting Director of the United States Bureau of Mines for permission to reproduce Figs. 7, 9, 10 and 11 from Bulletin 4, published by the U. S. Department of the Interior before the war, giving information and views of various producer gas power plants in Europe.

# Convention of National Retail Coal Merchants' Association

SPECIAL CORRESPONDENCE

SYNOPSIS—*The second yearly meeting of the retailers, held at Buffalo, May 14-16, proved most profitable and interesting to those present. Many excellent addresses were given, and a decided effort was made by the leaders to imbue the members with a new feeling that would supplant the old feeling of selfishness. Coöperation was the keynote of the proceedings.*

THE National Retail Coal Merchants' Association held its second annual convention in Buffalo on May 14-16, following the initial one held at Pittsburgh last year. Hon. W. Albert Smoot, of Alexandria, Va., the president of the association, was too ill to attend and his place was taken by John E. Lloyd, of Philadelphia, first vice president. The program was varied and interesting, bringing out men of note in the trade.

Only a morning session was held on the first day, the rest of the day being spent at Niagara Falls, closing with a supper at the Prospect House on the Canadian shore. The chairman of the local committee of entertainment, Albert H. Tracy, Jr., was suddenly taken severely ill and the arrangements were taken up by J. W. Noble.

The chair spoke briefly on coöperation and said that it was bound to take the place of the old selfishness in trade, which had worked a great deal of harm for a long time. It would be a splendid thing if the coal dealer, handling as he does one of the vital necessities of the world, could take the lead in this movement.

John M. Daly, of London, Ont., vice president of the Canadian Retail Coal Association, spoke as the "mouthpiece of the trade across the border." He said that the American fuel administration had been of wonderful help to Canada during the coal shortage, in spite of the fact that the dealers disliked to make reports of their sales, for it put them on an equal basis with the consumers in the United States. He complained only of the shortage, and said the mines should be made responsible for weights. He referred feelingly to the great sacrifice that Canada had made in the war. It was as great in personal losses as those of the United States, though the population was only equal to that of New York State.

The credentials committee found only about half of the affiliated associations represented, but further reports finally placed most of the 25 in line.

The nominating committee presented the names of 21 delegates as suggestions for directors. They were later elected without change, and are as follows: For three years—W. A. Smoot, Alexandria, Va.; Charles B. Staats, Albany, N. Y.; Walker Cottrell, Richmond, Va.; Wellington M. Bertolet, Reading, Penn.; Samuel Munter, Indianapolis, Ind.; John M. Daly, London, Ont.; A. P. Smith, Denver, Col. For two years—John E. Lloyd, Philadelphia, Penn.; W. A. Clark, Boston, Mass.; W. Hamilton Smith, Washington, D. C.; James C. Tattersall, Trenton, N. J.; Wallace G. Phinney, Boston, Mass.; Thomas Cossey, Danville, Ill.; William Bartrim, Kansas City, Mo. For one year—B. M. Watts, Baltimore, Md.; W. T. C. Berlin, Memphis, Tenn.; Milton E. Robinson, Chicago, Ill.; Albert E. May, Rochester, N. Y.; Richard J. Wulff, Brooklyn, N. Y.; Edward Schiewe, Detroit, Mich.; Arch. Coleman, Minneapolis, Minn.

"Wholesale and Retail Relations" was taken up at the Thursday morning's session by Arthur E. Rice, commissioner of the Coal Merchants' Association of New York. He said that the three branches of the trade should be brought together, instead of each trying to do business at the expense of the others. The organizing of the national association was a long step toward the accomplishment of this result. Much had been done by the Pittsburgh convention of that body. What constitutes a retail dealer should be sharply defined, and no other should be allowed to distribute coal. As to car weights, the wholesaler should be responsible for that, and he should give up that responsibility only on delivery. The operators who send out impurities in coal were reminded that the consumer is buying substitute fuel in quantity, and that crude oil is supplanting coal in a great many localities. The speaker was sure that many difficulties had been brushed aside so that the three branches of the trade could be brought together and much good accomplished.

### DEFINES FUNCTION OF RETAIL DEALER

Committee reports followed, and J. C. Tattersall, of Trenton, N. J., on invitation from the chair, told of the card system in use by his local association. By it the dealer could refer to every sale made in the city and note the price paid. Consumers were not allowed to get more than six months in arrears.

George H. Cushing, managing director of the American Wholesale Coal Association, spoke in the afternoon on "The Function of the Retail Dealer." After defining "function," he said the retailer's duty was to buy coal in car lots and sell it in less than car lots; to sell when it was wanted, and to furnish what was wanted. He said the retailer was a merchant, a warehouseman, a cartman and a banker, and should know what each of these branches contributed to his business as a whole. Sometimes one produced a profit while another did not. Speaking of the retailer's many bosses—those he bought of and those he sold to—he was sure that an effort to reform them would be difficult, so that it would be easier for the retailer to reform himself. No retailer really owned his business. He owned only the machinery of it. Mr. Cushing closed by referring to the establishment of a system of banks that were prepared to relieve merchants of doing any part of their own banking, by giving credit to buyers direct.

The address on "Coöperation in the Coal Trade," by E. W. Parker, director of the Anthracite Bureau of Information, wound up the regular program of the day. Mr. Parker said that the advance in the price of anthracite since 1913 was only 51.5 per cent., while nearly

everything else had advanced much more. Milk, which was the highest on his list, had advanced 163 per cent. One reason, the speaker thought, for more complaint of the high price of coal than of most other things, was that it was sold by the ton, while other commodities sold by the pound or dozen. Proceeding to show the mining cost of anthracite coal, he asserted that one advance of 35c. a ton was all that the Government would allow against an advance of 45c. to the miners.

The convention took up the subject of advertising and an enthusiastic indorsement of it was the result. Many reports of success were made. A general and continuous use of the daily papers, for the purpose of keeping the public informed on the state of the coal trade, was advocated by every speaker.

The regular banquet of Thursday, given in the convention hall, was largely attended. Enjoyment of the informal kind, with music and dancing, took the place of set speaking.

The Friday session was confined to the forenoon, as some of the speakers on the program did not appear. Peter Beck, of Harvey, Ill., read a short paper on "Sales to Employees," in which he argued against the practice. He was aware that it was an effort to keep the men more satisfied and prevent strikes. All selling of coal or anything else below what it should bring was demoralizing to the trade and did nobody any good in the end.

The customary resolutions, thanking the local trade for the fine entertainment it had given the visitors, were adopted. It was also found proper to remember the members of the association who were ill, of whom there was an unusual number. The resolution asking the operators to reduce the sizes of anthracite brought forth an animated general discussion. All agreed that there were too many sizes, but some took the view that the convention as a whole was not called on to discuss the matter. A resolution to refer the matter to the executive committee was lost. The plan was to call lump and large pea extra sizes, and to include two between them. Of steam sizes it was held that three were enough. In this form the resolution was adopted. The convention put itself on record as opposed to the gross ton.

The directors announced the election of the following officers: President, John E. Lloyd, Philadelphia; first vice-president, Peter Beck, Harvey, Ill.; other vice-presidents, W. A. Clark, Boston; T. Percy Bryan, Kansas City, Mo.; W. Hamilton Smith, Washington, D. C.; Charles D. Staats, Albany, N. Y.; H. D. Jones, Chicago; treasurer, Samuel D. Crowell, Philadelphia.

The officers, with the following appointed by the president, make up the executive committee: W. A. Smoot, Alexandria, Va.; R. R. Yeagley, Indianapolis; W. T. C. Berlin, Memphis, Tenn.; W. M. Bertolet, Reading, Penn.; W. B. Phinney, Boston; A. F. Rice, New York; J. Harry West, Baltimore; Walker Cottrell, Richmond, Virginia.

The final address was given by Stanley B. Houck, who had come from Minneapolis to be present the last day. He began by referring to the bolshevists and socialists as being always posted on their beliefs and principles and ready to fight for them. The coal association should take a lesson from them, and the members should not only know what they wanted, but be ready to take off their coats and defend it. When they went to Washington to ask for anything, they should know what they wanted and work together. He has known cases to come up before the Interstate Commerce Commission when nothing was accomplished because the petitioners, though all wanting the same thing, could not agree to present their views as a unit.

A point of vital interest to the convention was presented by W. L. Noble, of Buffalo. He had gone with a delegation to the Larkin plant to inquire into the report that the company was selling coal to its employees at cost. This was denied by John D. Larkin, Jr., but with the admission that it was being sold at a reduction of $1 to $1.25 below the local price by a coöperative association of the employees. The delegation tried to get Mr. Larkin to stop the practice or to oppose it in some way, but failed. Mr. Noble said that he did not think enough coal would be sold in this way to hurt anybody's trade, but the moral effect was bad; for if one sold in that way others would. He promised to watch developments and report.

At 1 o'clock the convention came to the end of its program, having completed an interesting and profitable meeting. The convention adjourned with a rising vote of appreciation of the work of the president, John E. Lloyd.

## Kentucky Mining Institute Meeting

The annual meeting of the Kentucky Mining Institute will be held at the Phoenix Hotel, Lexington, Ky., June 6 and 7. President Meguire will open the meeting on Friday, June 6, at 1:00 p.m., after which the following papers will be read: "Zinc and Lead in the Kentucky-Illinois Fluorspar District," by A. H. Reed; "Human Engineering," by M. L. Fellmer; "Gas and Coal Dust in Mines," by Col. A. G. Burrell; "Chemistry of Coal," by Major A. C. Fieldner; "Schedule Rating of Coal Mines for Workmen's Compensation," by H. M. Wilson; "Safe and Dangerous Practices in Coal Mines," by D. J. Parker. At 8:00 p.m., after the luncheon, the following papers will be read and discussed: "Depreciation and Depletion," by C. D. Burdick, and "Has the Metal Industry Any Lessons for the Coal Industry?" by R. Dawson Hall.

On Saturday morning, at 9:00 o'clock, Frank Morris will read a paper entitled "The Activities of the National Safety Council," followed by "Storage Battery Locomotives in Mine Work," by J. Appleton; "Mine Rail Bonds," by C. C. Beck; and "Permissible Explosives," by J. E. Miller. In the afternoon, at 2:00, a first-aid contest will be held for the "Institute Placque," won in 1917 by the team of the Stearns Coal and Lumber Co. The contest will be conducted under the regulations of the American Red Cross. Teams desiring to compete are asked to file the names and addresses of the team members, and the company they represent, with C. W. Strickland, Box 910, Huntington, W. Va., not later than June 2.

## Referred to the Anti-vivisectionists

A cruel use of men to safeguard the lives of canaries and mice has been discovered by Emery R. Hayhurst, consultant in industrial hygiene, Ohio State Department of Health. In a recent report published in *The Ohio Public Health Journal*, February, 1919, p. 67, he says: Afterdamp "has rather more effect on canaries or mice than upon men, so that the latter have been used as test animals."

# Dirt in Coal*

THE ash content in coal varies widely in different localities and frequently there is considerable variation in the same locality under different conditions of mining and preparation. The normal amount of ash may be considered as that found in the face sample of the seam proper; the excess ash is that which is added from the roof or bottom in the process of mining and which is not eliminated before the coal leaves the mine.

Lump coal made over a 1¼ in. screen usually shows the normal per cent. of ash, while the 1¼ in. screenings in most cases show one and one-half times the percentage of ash contained in the lump. This is due to various causes. Where mining machines are used they occasionally drive the cutter bar into the fireclay bottom, either by a failure to properly set the machine, which is gross neglect on the part of the machine operator, or through the cutter bar striking an uneven area of bottom clay under the coal seam, which is unavoidable.

Another factor enters here: The bottom bench of a coal bed frequently contains a greater proportion of ash than the upper benches, and undercutting in this bottom bench is one cause of increasing ash in the screenings. These undercuttings from a 6-ft. seam amount to about 7 per cent. of the output. Where the coal bed lies under a shale covering or roof, it frequently occurs that a portion of this cover comes down and mixes with the coal, as a result of heavy blasting and scaling off due to air striking it. This shaley substance easily slacks and finds its way into the screenings.

The ash content in screenings can be reduced nearly to that of the screened lump by the use of a jig gravity washer, with an ample water supply and a convenient place to deposit the refuse. However, the washing of screenings has been considered too expensive while the price of all coal was low, but since prices have gone 60 per cent. and more upward, and will probably remain so, it may be well, and at the same time profitable, to eliminate the excess ash by washing in the vicinity of the mines, thereby saving the use of cars for and the long haul on inert material amounting to about six mills per ton-mile to points where coal is finally consumed.

The following table showing ash and B.t.u. content of coal from a bituminous mine in the Central West district illustrates how the ash content of screenings can be reduced by washing:

| | Ash | B.t.u. |
|---|---|---|
| Dry or unwashed screenings | 22.61% | 8,895 |
| Washed screenings | 14.05% | 10,085 |
| Lump | 12.39% | 10,499 |

The excess ash in mine run and prepared sizes, made over a 1¼ in. screen, consists chiefly of blue band, sulphur band, sulphur boulders, or lenses from the vein; and from the roof, slate, shale and rock which frequently comes down with the coal as a result of improper blasting or lack of proper timber. This foreign matter can easily be removed by hand by the miner at the working face when loading into mine cars, or by having men or boys working on picking tables or belts while the coal is passing to the railroad car.

The performance of this work can be supervised by a regularly assigned fuel inspector. He often finds the mine manager or superintendent letting his miners become lax in cleaning coal at the face and using too much powder for blasting, or the dock boss and slate pickers on the tipple becoming dilatory in their work, the result being increased ash. A protest to the proper mine official by the inspector usually brings about a correction; again in other cases rejection of the coal will bring about results.

The Illinois Central R.R. is using a system of close inspection with suggestions to the mine superintendents on the ground while the coal is being loaded. As a result of this effort, the impurities removable by hand picking and based on actual carload tests have been reduced from an average of 2.733 per cent. in the year 1911 to an average of 1.535 per cent. in the year 1917, or a net reduction of 1.198 per cent., which applied to a consumption of 4,000 000 tons of coal used annually represents 47,920 tons less ash, requiring the use of 958 fifty-ton cars to move. The transportation cost of moving this excess ash an average distance of 266 miles, based on an "out of pocket" cost of five mills per net ton-mile, equals $63,733.60 per annum. This, however, is but a lesser saving.

Taking the established estimate of increase in efficiency due to reduction in ash of 1½ per cent. for each reduction of 1 per cent., the saving from this source—that is, the increased evaporative efficiency—with coal at a delivered price of $3.68 per ton equals $264,518.40, or a total saving of $328,252 per annum. What the measure of the economies following from reduced engine failures and reduction in engine-house expense amounts to is difficult of computation.

### Waste Due to High Ash in Coal

The total bituminous coal mined in the United States last year in round numbers approximates 585,883,000 tons, of which the railroads of this country consumed about 30 per cent., or 175,764,900 tons. Now assuming that if 1.198 per cent. of the excess dirt or ash had been removed at the mines, it would have reflected a saving of 42,193 cars, and the consequent expensive burden entailed by transporting and handling this "fuel parasite" through the regular channels to the refuse piles at some terminal points.

The Bureau of Mines has received repeated cases of complaint from coal consumers generally during the past year wherein the ash content in coal that normally runs 6 to 8 per cent. has increased to 12 and as high as 18 per cent.; now, if we assume 5 per cent. to be a fair average of the increase in ash, it would mean 585,883 carloads of burden to be handled on the entire output for last year.

The higher per cent. of impurities, especially sulphur in the form of iron pyrites, in coals running high in volatile matter, is a dangerous element in storing mine run or screenings, as these coals often ignite spontaneously when sufficient moisture is available to cause oxidation of the sulphur. This causes a rise of temperature sufficient to ignite the smaller particles of coal, which when properly mixed will start the whole pile burning. However, I have never experienced this effect where screened lump coal, free of all slack, was stored.

*Paper presented before the International Railway Fuel Association by L. J. Joffray, general fuel inspector for the Illinois Central Railroad.

The effective combustion of coal depends largely on the nature and per cent. of impurities it contains, especially so if the ash has a tendency to clinker, which is dependent on the percentage of silica, iron and lime in its composition. Tables I and II give analyses of coal and ash used in ten burning tests from ten different mines in Illinois and Indiana.

Table I gives the usual proximate analyses of the coals. Table II gives analyses of the ash. By referring to the column showing the clinkering and non-clinkering coals and then making a review of the ash table, we

TABLE I. ANALYSES OF COALS

| Test Number | Moisture, Per Cent. | Volatile Matter, Per Cent. | Fixed Carbon, Per Cent. | Ash, Per Cent. | Sulphur, Per Cent. | B.t.u. | Clinker |
|---|---|---|---|---|---|---|---|
| 1 | 3.37 | 31.31 | 55.19 | 9.63 | 0.64 | 12,325 | No |
| 2 | 6.02 | 30.00 | 53.50 | 10.30 | 1.30 | 12,136 | No |
| 3 | 4.61 | 31.35 | 54.05 | 10.00 | 1.19 | 12,368 | No |
| 4 | 2.92 | 33.10 | 51.25 | 12.73 | 2.96 | 12,389 | Yes |
| 5 | 4.99 | 39.22 | 43.99 | 11.80 | 4.43 | 11,768 | Slightly |
| 6 | 3.41 | 37.12 | 45.62 | 13.85 | 4.02 | 11,842 | Yes |
| 7 | 5.13 | 37.70 | 44.31 | 12.80 | 4.52 | 11,693 | Yes |
| 8 | 2.86 | 36.04 | 43.14 | 17.96 | 4.58 | 11,124 | Yes |
| 9 | 8.49 | 34.87 | 48.16 | 8.48 | 1.47 | 12,251 | No |
| 10 | 4.68 | 38.59 | 44.24 | 12.49 | 4.50 | 11,921 | Yes |

observe that the coals with non-clinkering ash are low in both sulphur and lime. In burning they did not clinker in a dazzling white fire of an approximate temperature of 2900 deg. F., while the ash in the clinkering coals fused at a firebox temperature of approximately 2200 deg. F. This indicates clearly that when the sulphur and lime content exist in high proportion to the silica, iron and aluminum oxides, it is the direct cause of the ash fusing at the lower temperature.

The bottom line of Table II shows the fusing point of the sulphur and the different oxides. From this it will be seen that by taking each element separately the fusing point is at a higher temperature than is usually obtained in the furnace of a boiler. However, by combining these elements in proper proportion with the sulphur, fusion at a much lower temperature takes place.

The conditions of these ten experiments as to draft, etc., were identical in each case. However, I have since

TABLE II. ANALYSES OF ASH

| Test Number | Sulphur (S) Per Cent. | Silica Oxide ($SiO_2$), Per Cent. | Iron Oxide ($Fe_2O_3$), Per Cent. | Aluminum Oxide ($Al_2O_3$), Per Cent. | Calcium Oxide (Lime), (CaO) Per Cent. | Magnesium Oxide (MgO), Per Cent. | Color of Ash |
|---|---|---|---|---|---|---|---|
| 1 | 0.64 | 59.0 | 3.1 | 31.0 | 5.6 | 1.3 | White |
| 2 | 1.30 | 55.2 | 8.3 | 26.6 | 7.3 | 1.3 | White |
| 3 | 1.19 | 56.1 | 8.1 | 27.2 | 5.4 | 0.9 | Light Gray |
| 4 | 2.96 | 45.4 | 25.3 | 16.9 | 11.6 | 0.8 | Reddish Gray |
| 5 | 4.43 | 49.1 | 32.2 | 13.5 | 4.5 | 1.4 | Reddish Gray |
| 6 | 4.02 | 35.1 | 22.4 | 10.2 | 30.8 | 1.5 | Reddish Gray |
| 7 | 4.52 | 43.3 | 24.1 | 9.0 | 19.9 | 1.2 | Reddish Gray |
| 8 | 4.58 | 44.8 | 20.3 | 18.6 | 16.4 | 1.5 | Reddish Gray |
| 9 | 1.47 | 45.8 | 20.2 | 28.3 | 5.4 | 0.0 | White |
| 10 | 4.50 | 27.1 | 52.3 | 14.1 | 4.4 | 1.2 | Dark Gray |
| Fusing Tem.° | 239 | 3227 | 2840 | 3416 | 3452 | 3882 | |

observed that either one of the coals containing the clinkering ash will give better results both as to combustion and reduction of slag in the ash by increasing the draft, which increases the flow of air through the fire bed and has a tendency to keep the temperature of the fire below the fusing point of the ash. Hence it is always good policy to assign the clinkering coals to a lower class of service, such as switch engine, local freight, and other light runs. However, when considering the possibility of burning the low grade clinkering coals to profitable advantage, such should not be construed so as to minimize the responsibility of those who are assigned the duty of eliminating all impurities.

## Mine Owner Held Not Liable for Injuries From Dynamite

In the case of Richards vs. Fleming Coal Co., decided by the supreme court of Kansas on Mar. 8, the mine operator is held not liable for injuries to a shotfirer from an accidental explosion of a charge of dynamite, the reason being that the servant at the time of the injury was violating the law concerning the use of the explosive in coal mines.

A law of Kansas (1909 Ch. 175) makes it an offense for anyone to use dynamite in a coal mine except under such rules as may be agreed upon between the employer and employees, with the approval of the state mine inspector. It appeared that the dynamite was generally used at the mine in question by exploding it by means of a plunger electric battery, and that such a battery could not explode the charge accidentally. The plunger battery got out of order and the servant was directed to use a dry cell. While arranging the wires and carrying a small charge of dynamite, the wires came in contact with the dry cell and caused an explosion.

The court denied the contention that the law was unconstitutional on the ground that it delegated power to the operators and miners to make rules which might vary with different localities. It was also held that the statute applied to a strip-pit mine as well as to one with underground workings.

## The Storage Battery Returns to Peace

Announcement has been made by the Electric Storage Battery Co. that the United States Government has given it a release on the "Ironclad-Exide" storage battery and that this product is now ready to take its accustomed place in those phases of industrial life where a storage battery of this character is an important factor.

Some items of the paraphernalia of modern warfare are not generally listed in the histories. For instance, the storage battery is used in battleships to furnish auxiliary power, not only for the intricate system of inter-telephone communication which keeps every department in touch with every other department, and for the lighting of cabins and gun decks, but for the actual operation and firing of the guns themselves. It also stood as a reserve behind the powerful searchlights with which the submarine chasers were equipped. Electrical accumulators, also, provided the power for undersea operation of Uncle Sam's submarines.

In almost every field of war activity storage batteries had their important corner. They were used on airplanes to provide ignition and starting power, and for the operation of the important landing lights. They furnished the vitality for the field wireless; put the punch into the starting and lighting of officers' automobiles; operated the electric locomotives and electric industrial trucks used in munition plants and on loading platforms; provided auxiliary power for the raising and sighting of our big coast defense guns, as well as that behind the operation of the lighting and telephone system of fort, army post and cantonment.

It is one of the strongest proofs that the world is again right to see our boys coming home; it is no less a cheering sign to see many units of the machine of war disassembled and taking up their old work.

# What Price Should the Coal Operator Charge the Boiler-Room Coal Account?

By C. W. Hippard
Urbana, Ill.

SYNOPSIS—*A few years ago many operators knew little about the details of the cost of coal production and preparation at their plant. The Federal Government monthly expense reports have tended to change all this. With the distribution of coal-production expenses, much information was gained. The following article takes up one phase of mine operation—the boiler-room coal. It is worthy of discussion, as it is an important item in the running expenses of a mine.*

PROMINENCE was given to the subject of the cost of coal production and preparation by the requirement of the Federal Government of a monthly expense report from all coal operators. Furthermore, in this day of scientific management, a cost-accounting system is an essential part of every up-to-date business. There has been considerable discussion about many of the details of colliery cost accounting in which was included the price the coal operator should charge the boiler-room coal account. There are several ways of solving this problem; either by charging the boiler-room account with the coal used at some definite price per ton, or by ignoring it altogether.

Formerly, it was common practice to take no account of fuel burned under boilers at the mine. It is not always easy to arrive at the exact price per ton which should be charged for this fuel; it may be an inferior grade of coal, which is not marketable. Furthermore, the weight of coal thus used is rarely known unless a special effort is made to ascertain the facts in the case. However, boiler-room fuel is an actual expense and should be charged. A company should know just what operating expenses to charge up to each department; if the costs are too high, the situation should be carefully investigated to see where costs can be reduced. There are a number of ways of arriving at the price which should be charged for boiler-room coal, and the various methods are all open to discussion; for the purpose of comparison, each is here given and commented upon.

First, considering the cost-of-mining price method. The plan of adopting the cost of mining as the price per ton to charge for coal appears logical. Some charge the actual cost of mining the coal, while others include overhead. The method of charging the actual cost of the coal has the advantage that it does not permit of a profit on coal used at the mine to appear on the boiler-house account. The disadvantages are that the cost of mining varies from day to day and discrepancies are introduced when a fixed price is used. Then, as is often the case, a grade of coal may be used which is sold in the market for a price which is less than the cost per ton of mining the entire output. Thus, when screenings are used under the boilers at the mine, the mining price should not be charged, as screenings sell for an amount less than the cost per ton for mining the entire output. On the other hand, the coal used in the colliery boiler room lessens by just that amount the tonnage which might be sold at a profit in the market, so the coal used in this way might be viewed in the light of a loss. This has led some people to believe that coal used at the mine should be charged at the market price.

This brings us to the second, or the market-price, method. This has the appearance of being a logical method, but fundamentally it is not. Thus, when there is a shortage of railroad cars for transportation, should all the coal produced at the mine be considered as having a value equal to the market price? The only coal for which a market price can be obtained is the amount which can be shipped to market. On the other hand, when there is a big car supply, the coal used at the mine should be worth the market price; for if it were not needed at the mine, it could be shipped to market. At all events the market price is variable, and a variable cost for mine boiler coal should be avoided if possible.

Third, let us consider the local trade price. Some operators consider that boiler-room coal should be charged at the same price as coal sold in wagon lots at the mine to local trade. Probably the only advantage of this method is that the price is likely to be fairly constant.

A fourth method includes a price compared with purchased power. The price of boiler-room coal may be calculated on the basis of comparison with power which may be purchased at a mine from an independent power company. This method is not generally adopted in accounting, as far as known. But at least one operator has been heard of who took a bid of a power company to supply power, and compared the offer of the power company with the amount he had been paying for the power generated in his own plant. Thereafter the operator considered the furnishing of coal to his boiler room as a contract at a definite price.

In reviewing all the methods considered, my conclusion is that the best plan is to ignore the cost of boiler-room coal in the cost accounting. Such items as waste of coal at the mine, discarding of impurities, difference between mine and railroad weights, among others, should be taken care of automatically. One advantage of keeping separate records of the items just noted might be the effect such a system would have on the management; any loss traced directly to some cause would tend to be remedied, or at least reduced to a minimum. Some of the comments here made do not agree with theoretical accounting practice, and I would welcome a discussion of the various methods by the readers of *Coal Age*.

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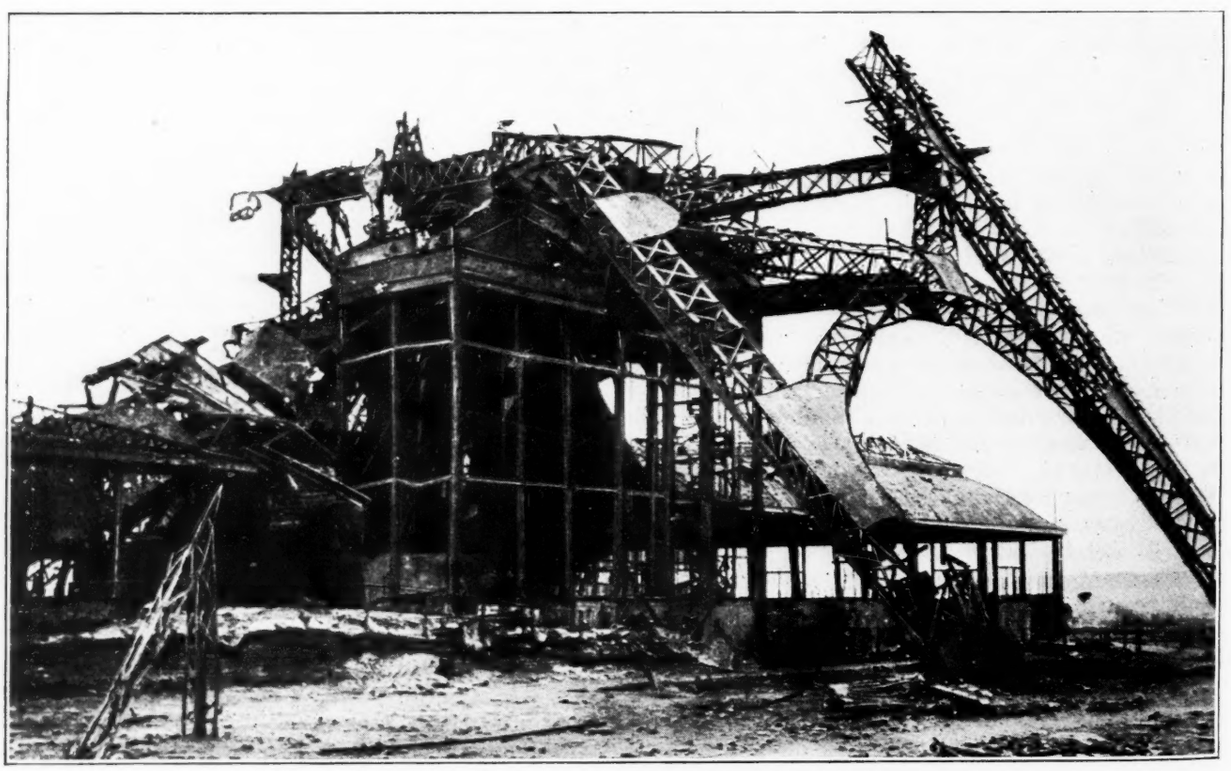
AN AUTHORITY on boiler practice has stated that in addition to the necessary and usual pressure gages and draft gages on boilers, it is also necessary to have a steam flow meter for the purpose of showing the amount of steam being delivered by each individual boiler. Steam flow meters indicate at once those boilers which are not up to the average. With this information changes can be made in drafting fires, to equalize conditions.

# SNAPSHOTS IN COAL MINING

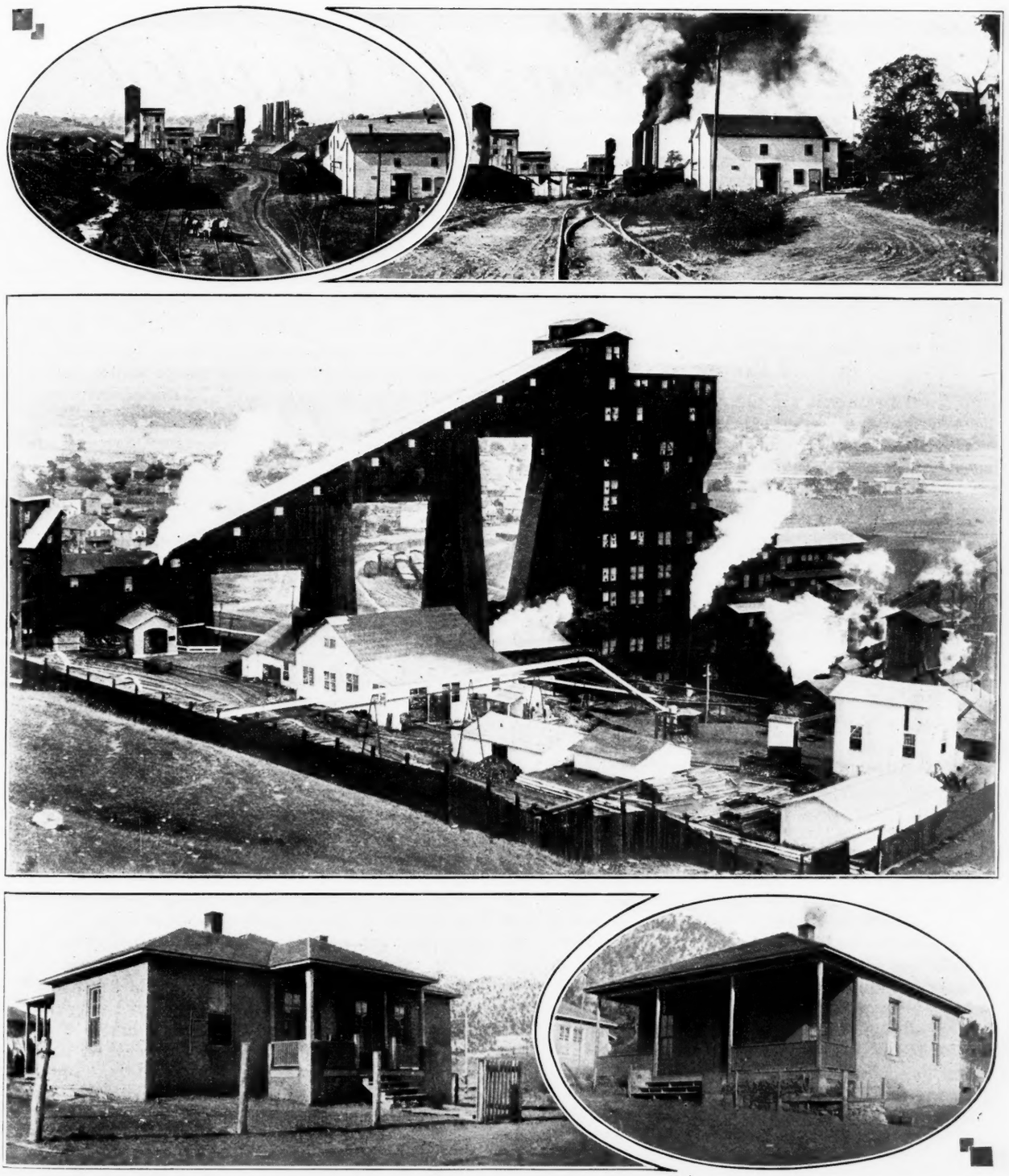
CUTTING PEAT IN A BOG IN SOMERSET, ENGLAND

It has been pointed out by experts both in America and in Great Britain that a mixture of peat and coke forms an ideal fuel for kitchen use. In England peat is used almost entirely in the districts where the bogs are found, and a new bill recently introduced in Parliament would facilitate the cutting and distribution of peat in greater quantities.



WHAT THE GERMANS LEFT OF THE COAL MINES OF LENS

As the British drove the Germans from the industrial centers in the north of France the latter wantonly destroyed every manufacturing plant. The coal mines, however, appear to have met with particular vengeance, for these were demolished completely. The photograph was taken in the autumn of 1918 and affords an idea of what the structures in the Lens region now look like.



TOP—VIEWS OF THE MANIFOLD MINE OF THE YOUGHIOGHENY & OHIO COAL CO., MANIFOLD, PENN.
CENTER—SURFACE PLANT AT THE FORTY FORT COLLIERY OF THE TEMPLE IRON CO., FORTY FORT, PENN.
BOTTOM—COMPANY HOUSES OF THE STAG CANON FUEL CO. AT DAWSON, N. M.; HOUSES OF THE TYPE SHOWN RENT FOR $2 PER ROOM PER MONTH

## WILL PAY $5 FOR THE BEST MINE PHOTOGRAPH

A READER can oftentimes obtain more information from a rapid glance at an illustration than from a laborious reading of paragraph after paragraph of mere descriptive matter. The illustrations accompanying the write-up of a new mine plant for instance, help to convey the story. Used in conjunction with a well prepared article, illustrations are an invaluable aid to proper understanding. All this is by way of preamble to a confession. *Coal Age* is meeting with ever-increasing difficulty in procuring photographs that will be of general interest and technical value to colliery men. So we want to enlist the aid of every reader of this paper in this matter. To stimulate interest, the editor of *Coal Age* will pay $5 each week for the best photograph sent in by any subscriber. Prints submitted must be for the exclusive use of *Coal Age* and must not have been previously published. All photographs not awarded the $5, but accepted for publication, will be paid for at a liberal space rate. The sender's name and address, with a brief description of the picture, must accompany each photograph. All prints will be returned, if desired.

## Would Divorce Railroads from Ownership in Coal Properties

Before the railroads are turned back to their owners, the American Wholesale Coal Association is urging the members of the congressional committees interested to include in the new statute a provision that the railroads are to be returned to private owners only when they have freed themselves from any control of coal property; any interest in coal lands or coal mines; any connection with banking houses or syndicates which hold coal lands or which own coal mines in the interest of any railroad corporation. "We believe," says the letter to the congressional committees, "that before coal can be put in that position of independence which will allow it to adopt effective means of reform, there must be a complete divorcement of the coal industry and the carriers. We believe the time to make this divorcement complete is when the railroads are returned to private control. We ask you to take this suggestion into account when framing the new laws regulative of the carriers."

## Little Hope for Export of Large Volume of American Coal

The allocation of ships in July for the exporting of coal will be too late to be of real service in the present coal situation is the opinion expressed by representatives of operators in Washington. If ships could be supplied immediately, a large tonnage of coal could be moved out of the country, to the advantage of all concerned. The foreign trade committee of the National Coal Association is now negotiating with the Shipping Board in connection with the entire export program.

Due to the inability of operators to work their mines to more than 65 per cent. of full-time capacity, many are of the opinion that there will be little high-grade coal available for export. The shortage of labor, as well as its general inefficiency at this time, has so reduced production that it is believed domestic contracts will take practically all of the output. If it were announced today that even a few ships were to be allocated for coal exports, it is believed that a scramble for contracts would begin at once on the part of coal users.

Operators who are interested in the export trade lament the fact that the negotiations are still in a conversational stage. It is pointed out that operators took up the export matter before the ink was dry on the armistice, but that they were estopped absolutely from carrying out any plan by the official statement that ships would not be available for an indefinite period. Officials now, however, are taking a different attitude and are anxious to start the coal movement. They now find that coal operators, in the face of an almost certain demand at home for their entire output, are more inclined to be deliberate and certain of their ground before taking action. The uncertainty as to the labor situation at the expiration of the Washington wage agreement is another factor having an important bearing on the situation. It is regarded as practically certain that a situation will develop which will militate further against production.

Owing to the prospects of increased demand, the operators were not greatly disappointed when the stabilization program of the Industrial Board failed to materialize. As matters stand at present, the coal industry, it is held, needs no stabilization.

## "Tuckahoe" Completes First Year of Service

On May 15, the steel cargo carrier, "Tuckahoe," completed its first year. The "Tuckahoe" has had an eventful career in the coal-carrying trade. She had the distinction of having been launched 27 days after the laying of her keel. While she was diverted to transatlantic use during a portion of the year, most of the time was spent in carrying coal. She now is en route from Norfolk to Rio de Janeiro with such a cargo.

The "Tuckahoe," which is a vessel of 3667 gross tons, broke all monthly records in the coal-carrying trade the first month in service with a total of four cargoes of coal from Norfolk and Baltimore-Boston, 19,000 tons in all. The fastest round trip during the war in this trade was made by the "Tuckahoe" in seven days as against the average time of 14½ days. Her slowest round trip was 12 days. This was due to a change of crew in Boston, delaying her four days in port.

## Would Have Engineers Receive Broader Business Training

Encouraged by the nation-wide interest in the movement to incorporate in all engineering courses a greater amount of business training, the Bureau of Education has called a general conference on the subject to be held in Washington June 23 and 24. It is expected that representatives of every technical school in the country will be in attendance, as well as many others who are interested in the subject. The sessions will revolve around these major topics: (1) Business training for the engineer; (2) engineering training for commercial enterprises; (3) significance of the war experience for engineering education; (4) training of the engineer for oversees engineering projects.

Curricula suggestions will be submitted to the conference as follows:

First, that a minimum number of hours in business training, to be determined by the committee, be required in all engineering courses. In respect to this suggestion it was recommended at the Washington committee conference that from 12 to 18 semester hours be required in all engineering courses on the following subjects: General economics; cost accounting; business organization; business law.

Second, that a curriculum providing for a minimum of 15 to 30 units in business economics be incorporated in all engineering courses and offered on an elective basis. In respect to this suggestion the Washington committee conference recommended that electives be encouraged in connection with all engineering courses in the following subjects: Labor and employment problems; statistics; corporation management and finance; political science; marketing, including advertising and salesmanship; psychology; scientific management; transportation. It was further recommended that economic phases of engineering subjects be emphasized wherever possible in engineering instruction.

Third, that a curriculum in commercial or industrial engineering, permitting full and proper emphasis upon engineering subjects, be offered in the School of Commerce, with degree to be given in that school.

Fourth, that a five-year combined engineering and commercial course be prepared. It was recommended at the Washington committee conference that no action be taken at this time on curricula suggestions Third and Fourth.

## Consumption of Army Coal in 1918

Much attention is being paid in Washington to the report, now being released chapter by chapter, of the Assistant Secretary of War, Benedict Crowell, reviewing the main activities of the War Department during the period of hostilities. He refers to coal as follows:

During the months of hostilities the American public was constantly informed in advertising literature that fuel would win the war, and indeed fuel would win it, and did win it, in the sense that without fuel or with any grave shortage of fuel we could not have won. In this sense there was no more important commodity contributing to success in the great drama than coal.

America began keeping the records of coal mining in the year 1807. Woodrow Wilson was inaugurated President of the United States in 1913. In the 106 years between 1807 and 1913, and including those years, American mines produced a total of 9,844,159,937 tons of coal. In the succeeding five years of President Wilson's administration American mines turned out 2,960,938,597 tons of coal, almost one-third as much as was mined in the entire 1807-1913 period, and almost one-fourth of all the coal mined in the United States since records have been kept.

The American coal miners in 1918 met the war emergency by producing 150,000,000 tons of coal more than they had dug in 1914. The shortage of coal in the winter of 1917-18 was due not to the inability of the mines to produce the required tonnage but to inadequate railroad transportation facilities and severe weather.

The war-coal project was in the hands of the United States Fuel Administration, but the office of the Quartermaster General assisted in the effort. Army officers were stationed at the offices of the various district representatives of the Fuel Administration throughout the country. These officers kept in constant touch with the factories making war supplies and saw to it that coal was diverted from less essential enterprises to the munitions factories. This service operated with such excellent effect that very few manufacturers working on Government contracts were compelled to suspend operations because of the lack of fuel, and those who did have to suspend were able to resume again within a few days.

During the summer of 1918 the usual seasonal slack in the demand for fuel was taken up by the action of the fuel branch in absorbing practically all of the excess coal in the United States and storing it at Army posts, camps, and stations. This action kept the mines working at maximum capacity during a period when there is normally a curtailment in output. Of course, at the time there was no realization that the fighting was to end so soon, and this policy was adopted in preparation for unchecked industrial activity during the winter of 1918-19.

The Army itself was a heavy user of fuel, requiring it not only at its various manufacturing establishments but also at the great camps for heating purposes. The following table shows the Army purchases of fuel for the calendar year 1918:

| | Amount | Cost |
|---|---|---|
| Anthracite coal (tons) | 710,304 | $4,362,237 |
| Bituminous coal (tons) | 2,706,737 | 11,711,335 |
| Total | 3,417,041 | 16,073,572 |
| Coke (tons) | 9,576 | 80,643 |
| Wood (cords) | 786,177 | 5,178,161 |
| Total fuel | ..... | $21,332,376 |

This is a complete statement of the fuel purchases for the calendar year 1918, and includes all Army camps, posts, hospitals and stations in the United States. The fuel branch maintained the policy of keeping on hand at the camps a three months' supply of coal as insurance against possible shortages in the market.

## Coal in Northeastern Utah

Coal was found in northeastern Utah on Lost Creek near Devils Slide many years ago, but it has been mined only because fuel is scarce in that region. Reports received from different sources have indicated that the beds discovered may be a part of a good coal field, so the United States Geological Survey sent one of its members to examine the region. The examination proved that the coal along Lost Creek occurs in thin, irregular beds, which are separated into several benches by bone and shale partings, and that it is subbituminous and cannot compete with the coal of higher rank which is found in vast deposits in other parts of Utah and in Wyoming, although it is of considerable value to the residents of small towns and ranches nearby.

The Lost Creek coal field is in Morgan County, Utah, 12 miles northeast of Devils Slide, on the main line of the Union Pacific R.R. For many years small quantities of coal have been mined and hauled by wagon to Croydon, a small town 9 miles southwest of the field, and to ranches on Lost Creek. The coal burns well in stoves and open fireplaces, but contains a high percentage of ash and "slate." It carries so much moisture that it rapidly falls to pieces on exposure to the air.

Geologists describe the coal-bearing rocks as belonging to the Wasatch formation, a Tertiary deposit laid down on the upturned and eroded edges of much older (Jurassic) beds. The Wasatch is composed of three parts—an upper and a lower conglomerate and an intervening series of beds of sandstone and shale. The coal was deposited on the surface of the lower conglomerate.

A copy of Bulletin 691-L, "Geology of the Lost Creek Coal Field, Morgan County, Utah," by Frank R. Clark, describing the rocks and coal resources of this region, may be had on application to the Director, U. S. Geological Survey, Washington, D. C.

# EDITORIALS

## Preparation of Bituminous Coal

WE PRINT on page 943 an article by Ernst Prochaska on the "Preparation of Bituminous Coal." This is the first of a series of articles on this subject, dealing mostly with the problem of coal washing.

While anthracite has been washed or mechanically picked for years, the advisability of subjecting bituminous coal to a similar treatment is in many instances an open question. In some cases the ridding of screenings of a few per cent. of ash by means of the coal jig increases the moisture content to such an extent as to largely nullify any benefits secured. In such an instance washing may be inadvisable.

On the other hand, some coals respond readily to the washing process and are consequently more desirable and efficient—and thus more salable—washed than unwashed. With the return to peace comes peace competition and, in an industry where the supply often equals or exceeds the demand, the operator will do well to avail himself of every means possible to insure a market for his product. There may be circumstances under which it might be advisable to wash all or a part of the output of a mine, even though no direct or tangible profit can be traced to the washery's operation.

Those operators who have been or are now considering the installation or operation of a coal washery will welcome these articles by Mr. Prochaska. While not exhaustive, they shed much light upon a subject that many of us understand only imperfectly.

*McAdoo says that some railroad wages were scandalously low under private management. They were; and why? Because the Interstate Commerce Commission made rates inadequate. When the Government took over the railroads, rates were increased immensely; but even then the railroads were run at a loss.*

## The Integral Part

WE ONCE read a book in which a reporter, who had just interviewed a man of progressive ideas, said: "Why! That man's plans will take a thousand years to materialize." He wondered, as we did, how any man could look forward to so far-distant a future with any desire to aid in accomplishing the things which could not do him the remotest possible good.

And yet there is a certain type of mind that works with the full knowledge that what it strives to accomplish cannot, by any chance, come true within a lifetime. But in spite of that knowledge, such a one will work on, believing that he can hasten the coming of the thing desired, and knowing that with his help it will arrive a bit sooner. So he is willing to do his own, the integral, part with full faith.

That, we suppose, is the proof of a really unselfish ambition.

It seems as though most of us want something more tangible, and at least more nearly at hand than that which is not to be realized within a thousand years.

However, don't we all work unselfishly—to a certain extent? Do most of us see the final use that is made of our labors? For example, take those of us who help dig the subways of the big cities. Not many find that the great systems serve us, individually, after they are finished: but we have helped make it easier for those workers who have long distances to travel day after day.

Another instance: Consider those who are spending their days on some company's books, keeping accounts straight. They do not see the goods arrive and depart, though they figure on them, and speak of them daily; nor do they often see the actual money that is involved in the various transactions.

So, too, are we who work in the mines simply integral parts, expending the energy that comes to us, so that life may be made better for others and, eventually, for all those who are to come after us. Just as the men who make the tools we work with do not witness the use of their products, so we do not see the great boats that are propelled across the ocean, the great mills that produce the woolens we wear, nor many of the things that contribute to the world's good, though all these things have life partly because of our energies. But we do, nevertheless, know that we are helping in the great advance, the great march of progress, and that others are doing things for us—to lighten our work.

There are many working for us at the very time this is being written, and just at the moment this is being read. There are men even now who are trying to perfect experiments which will make the undercutting, the drilling and all the rest of it easier for everybody.

Let us try to do our part with a conscience. Let us try to make our output a product so clean and so solid in worth that those who use it will say: "Someone has done his job well, knowing that it would be appreciated. He must have been thinking of us."

*Government regulation should regulate. It should not merely cut off the peaks of profit while leaving all the valleys of loss, but it should provide and assure an even return. If the public is to be umpire, it must be a fair umpire and not a prejudiced one. A guaranteed profit of 6 per cent. is one thing, a maximum profit of 6 per cent. is another.*

## Coal Export Waits on Shipping

GIVEN enough ships and a sufficiently low ocean freight rate, American coal producers not only can export a large volume of coal, but, what is more to the point, by so doing can bring to life the now listless coal industry. To make this latter statement clear, it must be remembered that not all the fuel mined here is suitable for export. In fact, the American coals that have found favor in foreign markets come from the

Pocahontas and New River fields of West Virginia. If we could export a large tonnage of this fuel, it would mean that coal mines in the Middle West would be enabled to work more regularly than they do now. Instead of demanding and receiving Eastern coals, consumers in Indiana and Illinois, for example, would be forced to burn fuel produced from mines in their respectives states.

The exporting of a large volume of coal, therefore, would stimulate the coal industry at home. Due, however, to a lack of bottoms and prohibitive ocean freight rates, American coal exporters find themselves in a peculiar, if not unpleasant, situation. Not only are they unable to accept or consider the many inquiries for coal coming from abroad, but, what is worse, they are compelled to stand by futilely and watch the trade they have succeeded in building up with South America slip back to England.

Already more Welsh than American coal is being unloaded at South American ports, and unless some concrete action results from the conferences now being held in Washington relative to the export of coal, Great Britain will regain most, if not all, of the South American coal business she lost during the war.

Although the prices of American coals at Hampton Roads are considerably lower than the prices of Welsh coals at Cardiff, this advantage is wiped out because it costs the American shipper $8 or $8.50 a ton more to ship his coal to South America.

Enough ships must be allocated for coal exports, and at rates that will enable us to compete with British shipping, if our foreign trade in coal is to be more than a dream.

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*If Walker D. Hines is willing to give the public transportation at a loss of $768,000,000 a year, why should not the steel corporations and the coal companies be equally generous with their money and give steel and coal to the railroads at a loss? The answer is easy: Walker D. Hines makes himself a good fellow with the money of the public, while the wicked steel and coal barons must spend their own.*

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## Don't Yawn in Company; It's Impolite

TO YAWN in company is unbecoming and rude to those who happen to be present. Then, again, it's catching. However, it certainly is a relief to one's feelings.

Here is some more advice: Don't predict a business depression in company. It's unbecoming—the gloomy man is never liked. It's rude—a man who has no faith in the ability of his fellows to meet a little hesitation in business by plain reasoning and a gust of enthusiasm is a poor citizen.

And it's catching—most men don't think. They catch the "glooms." Conditions don't create them. It's the discouraging man who says, "Steel, yourself! It's not going to kill you," who robs the public of its courage. When a man who has the "glooms" appears, the thoughtless catch the disease by ordinary infection, and even the thoughtful get it by a process of false argument. "Surely," they say, "this man has seen something that I haven't seen. He knows his own particular business better than I do, and that being so he has been convinced that troublesome days are ahead. He is probably correct in his judgment or he would not have formed it."

Like as not, the man to whom the thoughtful men refer never saw a wraith himself but saw another man who had caught a glimpse of a third man who had been introduced to a fourth man who thought he had seen a wraith and was shaking with fear. So the word passes along that there are troubles ahead.

Thinking up what would come "after the war" has been a favorite parlor game since 1913. Most of the guesses have been wrong, and forfeits have been piling up. Between the hopeful, who imagined a new heaven and a new earth for labor and capital, and the depressed, who visioned a Dante hell for both, there lies an even course for sober men. Prices and wages are staying up or gently increasing. There is every reason for confidence. If only the wage and price reductionists would cease yawning in public and repeating to the assembled company: "I worked so hard yesterday. I knew I would be sleepy today."

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*It has been clearly proved that the Interstate Commerce Commission, as a body, was incompetent and unfair in handling the railroad tariffs before Government ownership was established. The incoming Congress should provide a successor with more judgment and force of character.*

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## Six-Hour Day Only a Temporary Cure

A SIX-HOUR day might for a while create a decreased productive capacity, and so help the Middle West coal operations to obtain steady time. As a result the manufacturers of the Middle West would have to burn Middle West coal. Soon, however, there would be a large development in West Virginia and central Pennsylvania, because those regions could not fill their orders for high-duty coal without such development. Eventually the new mines in those regions would be so numerous that they could fill all the orders placed with them, and the Middle West business would return to its present stagnated condition.

The six-hour day is a temporary cure; it could not provide a permanent relief. Shortening of time and restricting of output are like morphine—they need renewal. They create a need as well as fill one. Take a little of them and you soon need more. If the hours are to be shortened or output restricted it should be for the improving of the physical, mental and moral well-being of the workingman, and not as an economic expedient; for, as such expedient, it will never be a success. It will produce an excess of mine development even in the Middle West, and so create a condition that will negative its own effect.

When we reduce hours let it be done by all together. Let the mine worker work as long for the shoemaker and the garment worker as they work for him. Let them exchange hour for hour. The mine worker is the brother of the shoemaker and garment worker and should give labor for labor to these men. Democracy demands it and fairness requires it.

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*Get your idle dollars working. Repairs, long delayed, should now be completed. During the war it was a virtue to delay repairs, to have shabby and even disorderly works. Now is the time to spend the money thus saved in putting plant and property in proper working order.*

# THE LABOR SITUATION

EDITED BY R. DAWSON HALL

## General Labor Review

When the war is over and a bituminous coal contract is made, let it be one so flexible that it will endure. Let it not be an ironclad contract that does not recognize changes in cost of living, but an agreement which will be automatically revised with changing values of the dollar.

The price of coal is none too large, but it is now, and will be always, a function of the wage paid. If that wage be raised, the price will rise, so why worry. If an increase is justified by a raised living cost let it be, not merely conceded after a struggle, but given as a matter of course.

Let a wage-revision feature be provided in the bond, as is already the case in British Columbia. Every agreement should be so worded as to avoid contingent injustices; then the tendency to break labor contracts will be checked. Some day the Government will order that the dollar have a certain relation to the cost of living as Prof. Irving Fisher advises, or will require that debts should be repaid and interest given in accord not with the face of the promise, but with regard to the real value of the money at the date of payment, as has been advocated by conservative economists in Breat Britain.

Arrangements like these will make strikes less frequent, will render business more steady and will secure to the saving working man, as well as the capitalist, the full value of his savings.

### ONLY LOCAL STRIKES NOW OCCUR

In every region the strikes and disagreements now occurring are of a purely local character and do not bode any general disturbance. Fortunately they are few in number. On May 10, 300 employees of the Racket Brook Coal Co., who suspended work to compel that concern to reinstate a motorman and brakeman, returned to work leaving it to their grievance committee in session with the company officials to settle the dispute. The Racket Brook miners, however, had really another matter for which they desired a favorable settlement.

Certain of the miners had been working in the Keystone workings where the area is under pressure and the coal easily removed. They demanded pay for solid-coal mining where such coal was encountered. The company apparently regarded all the work as the equivalent of pillar work, and as easy mining, and therefore payable at pillar-coal rates. The grievance committee could not get a hearing as to the complaint. The reinstatement difficulty only added to the friction experienced with regard to the rating of the work in the crushed area. In the final upshot the motorman, Kreech, was reinstated with pay in full and many other provisions made.

### MINERS WANT WORK ON IDLE DAYS

In the Hazelton region the miners are not disposed to lay down to the day workers and do not approve of being idle whenever the breaker is closed down. They have informed the C. M. Dodson Coal Co. that if they are not permitted to cut coal on idle days they will go on strike, tying up the Beaver Creek colliery indefinitely. They claim that they cannot supply the drivers if they are not given a chance to get coal ahead.

Umpire C. P. Neill, of the Conciliation Board, has handed down a decision in the case of certain miners employed at the Enterprise colliery in the Schuykill region. They held that they were entitled to share in an increase of $2 per day granted to the inside men of this particular colliery. Umpire Neill declares the men are contract miners, and as such are not entitled to share in the increase.

The protesting miners claimed that they were company men, while the company contended they were contract miners and as such were entitled to the 40 per cent. increase given to this class of employees.

Some parts of central Pennsylvania have been working very slowly. A report of May 12 says that the Rochester & Pittsburgh Coal and Iron Co.'s mine, Helvetia, has been averaging only one day a week and that the men are moving away to places where better time can be secured. Eriton, a mine operated by the Northwestern Mining and Exchange Co., a subsidiary of the Erie R.R., is receiving many of these men. Being owned by a large railroad without many mines to supply it with coal it has always had an enviable reputation for steady work. Some men are going to Onondaga mine near Sykesville, but there the lack of houses prevents any great influx of men.

### OBJECT TO LOW RAILROAD COAL PRICES

President Keeney and Secretary Mooney of District No. 17 have addressed the following letter to Walker D. Hines, the Director General of Railroads:

"Upon information at hand we are compelled to protest vigorously against the action of the Baltimore & Ohio R.R. in contracting for coal at less than the government price. In information given out by Fuel Agent Foos, of the Baltimore & Ohio R.R., under date of Apr. 21, we find the following with an additional statement that there are some other contracts which have not been acknowledged and which will be given out later: The Franklin Coal and Coke Co., 300 tons per day at $1.75; Central Fairmont Coal Co., 100 tons per day at $2.00; Big Run Coal Co., 200 tons per day at $1.85; New England Coal and Coke Co., 250 tons per day at $1.90; Berryburg Coal Co., 50 tons per day at $1.85; Fairmont Big Vein Coal Co., 200 tons per day at $2.10; Meyersdale Smokeless Coal Co., 100 tons per day at $2.15; Big Chief Mine, 100 tons per day at $1.90.

"The Chesapeake & Ohio Railway Co. has two fuel mines of their own in this district, namely: Dorothy, W. Va., and Eunice, W. Va. Since the depression in the coal industry these mines have run practically every day, and other mines in their immediate vicinity are idle.

"We feel that, regardless of the fact that these mines belong to the Chesapeake & Ohio Railway Co., the work should be more evenly distributed to other mines in that vicinity and that they should be given the opportunity to produce their proportion of the fuel consumed by the railroad. The prices quoted above are all less than the government price, set by the United States Fuel Administration, and are below the cost of production, based on the wages now being paid.

"If the railroad administration maintains its attitude by signing contracts for prices below the cost of production, it is only a matter of time until the operators signing such contracts will undertake to reduce wages and thereby bring about industrial disputes, which is just what we wish to avoid, if possible."

### LOCAL DISAGREEMENT CLOSES MINE

The Park City mines in Utah are reported all closed as the result of a strike. About 1000 mine workers in that region want a six-hour day and a wage of $5.50 a day. Park City is in Summit County, 21 mi. east-southeast of Salt Lake City. Little has been stated of it as a coal center, and the area referred to by the name of the Park City district may be an extension of the Cumberland, Wyo., field to the northeast. The pumpmen in the Ontario mine, it is said, left their pumps unattended, May 7. Flooding of the mines is likely to follow.

# The Miner Cannot Live Unto Himself Alone

The miner produces coal for other workingmen to use for heating their houses. Some of it is used to feed boilers, which make the steam that, in its turn, drives machinery that manufactures what workingmen will use. Knowing that this is true, the workingman realizes that he must not raise wages out of proportion to living costs. If he does, the real (or ultimate) consumer of his coal, who is another workingman like himself, will not only have to pay more for it and for what is produced through its use, but will have to pay more than he should.

# DISCUSSION BY READERS

## Waste of Coal

*Letter No. 5*—A short time since several letters appeared in *Coal Age*, relating to wastefulness in tne mining and marketing of coal. There is a great difference, in respect to waste, among the several mines, owing largely no doubt to the different conditions existing in those mines. To a very considerable degree, however, undue waste can be attributed to the negligence of miners and mine officials, improper methods of mining, or a reckless desire to produce a large tonnage regardless of the future working of the mine.

While some mines are recovering relatively 100 per cent. of the coal in their property, others are extracting little more than 50 or 60 per cent. In most of the latter cases, a far greater percentage of extraction could be obtained if more time and care was given to the preparation of a proper working system, adapted to the particular conditions at hand.

The desire of the management to produce a large tonnage quickly often leads to the unwise robbing of pillars that are needed for the protection of adjoining workings and results in the loss of much coal that can never be recovered. The same is true when a foreman is desirous of making a good showing on his daily tonnage sheet. If it were not for these reckless methods, many mines could increase their percentage of recovery 20 or 25 per cent.; but, to do this, more attention must be given to a uniform development.

### Advantage of Estimating Coal in Acres

The custom too largely prevails of estimating a newly acquired coal property as containing so many acres. If the property in question was estimated on a tonnage basis, it would have the effect of emphasizing the fact that it is important to send every ton of that coal to the surface. In the estimation of *acreage*, a pillar more or less left in the mines and lost appears of little significance, being so small a fraction of the acre that it is ignored as inappreciable. But, when it is remembered that this small pillar left behind means a loss of 200 or 300 tons of coal, the fact has a deeper meaning.

Again, estimating in *acres* suggests to the mind the purchase price per acre; while estimating in tons involves the price per ton that the coal will bring when loaded at the tipple. Mining men know that there is a vast difference between the value of coal in place and its market value after it has been mined.

Consider for a moment the loss of a single pillar left in the mine and representing a value of $200 or $300 and then think of the larger loss resulting when many of these pillars are lost beyond recovery, through improper methods of mining or undue haste in increasing the output of the mine. The attitude of many a coal operator, in this respect, is quite similar to his habit of thinking that the coal burned under his boilers costs him nothing.

In this connection let me urge that every foreman be made to estimate the coal in the supporting pillars in his mine, by its value on the tonnage basis. It will give him a greater incentive to get out every ton of coal in such pillars; and he will put forth more strenuous efforts to do this, knowing that the track, power and drainage lines, timbering and other requisites are all at hand, and every ton of coal recovered from the pillars is so much clear gain. The lack of thoroughness in coal mining is the great underlying secret in the matter of waste that we are considering.

### Wasteful Methods of Burning Coal

There is a great deal of truth in the fact often mentioned that a far greater waste of the energy of coal occurs in its transformation into power. Some are even inclined to hold the opinion that it is needless to trouble oneself about the loss of coal in mining when such wasteful methods are employed as are in use at present for the production of power. Few people realize how large a percentage of the energy of the coal burned in the furnace passes up the stack, instead of being utilized in the production of steam. This loss, however, is the engineer's problem and in no way concerns the waste of coal in the mines.

The incident cited by Joseph R. Thomas, in his letter on this subject, *Coal Age*, Jan. 16, p. 160, illustrates in a striking manner the large loss of coal that often occurs through the negligence of miners. He instanced two men working in adjoining rooms and mining their coal under like conditions. One of these men produced 43 more cars, in driving his chamber, than the other whose failure to do the same represented a loss for which no excuse could be offered. It is a difficult matter to discuss the needs of uniform methods of mining with men unless they can be brought to see the advantage to them on the tonnage sheet.

F. C. SANNER.

Piney Fork, Ohio.

## Exhaust from Steam Pump

*Letter No. 5*—Referring to the inquiry that appeared in *Coal Age*, Mar. 20, p. 549, relative to exhausting a steam pump into the suction line, let me give a little of my own experience in that matter, which may be of interest to some readers.

Starting from the foot of the shaft, in our mine, the main entry was driven on a considerable dip, which continued for a distance of 500 ft. As the entry advanced sumps were sunk in the floor near the face, and a small pump was located at the shaft bottom to draw the water from the entry and discharge it into the sump in the shaft, under the cage.

This pump was a small double-acting pump, having a 2-in. suction and 1½-in. discharge. It was supplied with steam through a 1-in. pipe line run down the shaft. The plan worked well, for a time, until the entry had advanced so far that the pump gave poor service, owing to the increased length of the suction line. It was then moved to the foot of the dip, 500 ft. distant from the shaft. The former suction line now became the dis-

charge, and a new sump, 4 x 5 ft. and 3 ft. deep, sunk just below the pump, improved the service.

What was peculiar about this arrangement was the fact that I could pump water into the sump or out of it as I chose. I ran a short pipe, from a tee in the discharge line, to the sump. Another short pipe was run from the suction line into the sump, while the exhaust port of the pump was fitted with a pipe that entered the suction line about 4 ft. from the pump. Suitable valves were provided in these pipes so as to control the action of the pump in any manner desired.

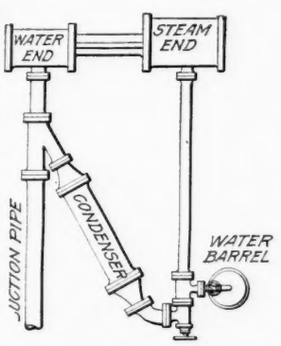
In starting the pump, the valves were arranged to exhaust directly into the sump; but when the pump had caught the water and was working properly the exhaust was turned into the suction line. It frequently happened that the steam exhausted into the sump while starting made the water very hot. But, in that case, I could pump it out and fill it again with cold water. The scheme worked well and all the trouble I had was that it was necessary to watch and stop the pump before it got out of water. If this was not done, the hot exhaust steam would find its way into the discharge line, expanding and throwing the pipe out of line.

Shelburn, Ind. R. J. PICKETT.

[The plan outlined by this correspondent appears to have for its chief object the cooling of the water in the sump, from time to time, by allowing water from the discharge line to flow back into the sump. The scheme is open for discussion.—EDITOR.]

*Letter No. 6*—The discussion of the question of disposing of the exhaust steam from a pump located in a mine recalls a scheme that I employed some years ago to get rid of the steam exhausted from a pump located at the foot of a mine slope.

In that instance, I adopted the plan shown in the accompanying sketch. We utilized a 9-ft. length of old pipe of twice the diameter, or four times the area, of the suction pipe of the pump and rigged it up to serve as a condenser. The arrangement is illustrated in the figure. It will be noted that the exhaust pipe, from the steam-end of the pump, is connected with one end of the condenser, the other end of which is joined to a Y in the suction pipe, at a point from 6 to 9 ft. away from the water end.




The position of the condenser, as shown in the sketch, was such as to cause the steam exhausted into it to assist the flow of water in the suction pipe. Entering the pipe at an angle of 45 deg. gave far better results than if this connection had been made at right angles, or in other words, if a T had been used instead of a Y connection.

In order to start the pump properly, it is necessary to have two valves on the exhaust pipe. When starting, and until the pump has caught its water, the valve leading to the condenser is closed and the other valve opened, which permits the steam to exhaust into the water barrel shown in the figure. But, after the pump has started and is drawing its water the first valve is opened and the second closed. The steam is now exhausted into the condenser and passes into the suction pipe as water.

I found that this arrangement not only got rid of the steam, which was a great annoyance in the mine, but the capacity of the pump was greatly increased, in respect to the height of the suction lift. I consider this arrangement very practical PUMPMAN.

McKeesport, Penn.

# Longwall Work in Low Seams

*Letter No. 1*—Referring to the proposed modified longwall system described by Charles Martin, *Coal Age*, Mar. 20, p. 520, permit me to say that I cannot understand his reference to "big, heavy cumbersome machinery to be moved in following up the face," in a regular longwall system. It hardly seems possible that he can refer to the common belt conveyor that is so generally used on a longwall face in working a low seam of coal. There is no difficulty in moving such a conveyor forward, the work requiring a minimum of labor.

Instead of using a belt conveyor, Mr. Martin suggests installing a small rope haulage on each heading, for the purpose of operating a scoop having a capacity of 1 ton of coal. According to his description, the scoop is to be drawn back and forth along the face, by means of ropes operated by the hoist.

This reference recalls to my mind a "Thompson conveyor" that I saw working very successfully in a mine, some years ago. It consisted of from four to six low pans or slips made of sheet steel and supported with angle iron. Each pan was 5 ft. long and 2½ ft. wide, and these were coupled together and hauled back and forth, along a 300-ft. face, by means of a light haulage rope, after the manner of a main- and tail-rope system. One rope was attached to the front end of the first pan and the other rope passed over a tail sheave and was then attached to the rear end of the last pan.

### SCOOPS NOT ADAPTED TO SOFT OR UNEVEN BOTTOM

This scheme worked successfully, in the case mentioned, because the bottom was smooth and presented no obstruction to the sliding pans. My great objection to the use of a scoop, in the manner described by Mr. Martin, is that if the floor was at all soft or uneven it would interfere with the success of the operation. Again, if the seam contained partings that had to be separated from the coal, there would be more or less of such foreign matter picked up by the scoop and loaded out with the coal. That would be particularly true if the scoops were to be loaded after the manner of the scrapers commonly used in grading and excavation work on the surface.

One of the advantages claimed for Mr. Martin's proposed method is the oblique face he has mentioned and which is shown in the cut on page 520. For my part, I fail to see the necessity for it, and believe there would be danger of the roof pressure crushing the coal at the angle where the two oblique faces meet. It might even happen that the settlement at this point would bind and hold fast the cutterbar of the machine. The cost of working would also be greater by this method than with a single 300-ft., straight, longwall face extending between the two main roads or headings.

In over 20 years' experience in longwall machine mining, I have found no difficulty in controlling the fracture of the roof when operating a 300-ft. face between two main haulage roads. I believe that it is all a question of systematic timbering and building the necessary

wood chocks on a bedding of slack about a foot in thickness. These chocks are taken down and carried forward as the face advances.

Regarding coal-cutting machines, let me say that the longwall machine has a decided advantage over the shortwall machine, for this work, as it requires only a clearance of 2½ to 3 ft., in width, along the face, as compared with the 6-ft. clearance required to operate a shortwall machine.

Referring once more to the plan illustrating Mr. Martin's proposed method, I cannot see how the roadway marked "line room" is going to be kept in good condition to serve as a return airway, unless a solid pillar of coal is left between this road and the longwall section. In the description, no mention is made of the thickness of the seam or the character of the underlying and overlying strata, or whether the mine is dry and gassy or the workings wet, all of which have a considerable bearing on the best method of mining in the longwall system. ANDREW ORR BAIN.

McKeesport, Penn.

## Roof Conditions in Longwall Work

*Letter No. 3*—In answer to the inquiry of "Sandrock," *Coal Age*, Mar. 27, p. 591, regarding the conditions presented by a hard sandrock roof, in mining coal by the longwall system, I desire to submit the following as a result of my own experience in mining coal by longwall, under conditions somewhat similar to those he has mentioned:

Wherever practicable, in the working of a low seam such as this, at least 2 ft. of roof should be taken down and built into uniform packs on each side of the roadways leading to the working face. If there is sufficient material for the purpose, an extra pack 6 ft. wide should be built about midway between adjoining working places. These packs in the gob or waste, however, must not be made too solid, as that would have the effect to throw too great a weight on the roadpacks and the working face, which would have a tendency to cause the floor to heave on the roads and might produce a disastrous break in the roof, at the face.

### Danger in Disturbing Bottom Liable to Heave

Whenever the floor in a mine has a tendency to heave it should be left strictly alone; because, when once broken, the heaving will continue to increase and may be so rapid, at times, that great difficulty will be experienced in keeping the track in shape and maintaining the necessary headroom for the cars to travel. This applies particularly to a fireclay bottom, where the mine is wet.

An important feature in the proper control of the roof, under the conditions here described, is to withdraw all posts and other timber from the waste. My practice is to build cogs only at the face, my experience is that few if any wood packs should be built, in longwall work, with the idea of leaving them in permanently. The wood packs sometimes built alongside the roadways offer a much greater resistance to the roof than stone packs, which tends to throw more weight on the face than is necessary to break the coal, and presents the danger of causing a break in the roof at the face.

Where stone packs are built uniformly, in the manner in which I have described, and no timber is permitted to be left in the gob, the result will be that the roof and floor will come together gradually back in the waste, which is absolutely essential in all successful longwall work.

Let me state, here, that wider packs must be built and more roof taken down on main haulage roads than in the working places. However, my experience is that these packs should all be built of stone, in order that a small uniform resistance will be presented everywhere and better results be obtained in the settlement of the roof. In my opinion, everything depends on this uniformity of the packwalls protecting the haulage roads and working places. HARRY MARSON.

Martins Ferry, Ohio.

## Panel System of Mining

*Letter No. 4*—Kindly permit me to refer to the letter submitted by a mine foreman of Clinton, Ind., which appeared in *Coal Age*, Apr. 10, p. 680, and discussed the panel method proposed by R. J. Pickett, in the issue, Feb. 27, p. 419, regarding which he asked for suggestions.

While this foreman, in discussing the driving of entries and rooms in panel mining, offers much sensible and friendly criticism and makes many good suggestions that are practical, his idea of driving rooms only 22 ft. wide could not be applied to our mines here in Sullivan County, under the present agreement with the United Mine Workers of America.

In Indiana, entries are driven under what is known as the "Syndicate system," by which three men will drive two entries and turn the roomnecks, to do which they will be given the exclusive use of a mining machine. Syndicating a room, however, is considered contrary to the agreement with the union and is not tolerated.

### Conditions in Sullivan County, Indiana

But, the 18-ft. air-course proposed by Mr. Pickett would be considered as a room and not an entry, and trouble would also arise, under the present agreement with the union, regarding the suggested 22 ft. for the width of rooms. In Sullivan County, it is customary for two men to work two places, from 25 to 30 ft. in width, with tracks laid at the center of each place. Any less width than that last mentioned would require the giving of an extra place to every two men, and this would certainly operate as a disadvantage in the daily production of coal, or the tonnage per man.

Referring to Mr. Pickett's inquiry, I believe the operation of which he has charge is in the No. 5 vein, in Sullivan County. Inasmuch as I have had some experience, myself, in working that vein in the same county, I may be permitted to offer my views on his present system and the changes he proposes to make. Let me say, first, however, that I agree fully with the suggestion of the Clinton foreman, that the driving of an 18-ft. air-course, with only a 10-ft. pillar to protect it from the old workings, would certainly invite a squeeze that would prove expensive. Furthermore, the driving of such an air-course would also act to retard the development of the room entries, since the rooms would be driven nearly as fast as the entries.

In describing his present method of working, Mr. Pickett states that cross-entries are driven off the main headings, about 1000 ft. center to center, thereby giving space for the turning of 22 rooms on 40-ft. centers, besides making allowance for solid pillars of coal protect-

ing the cross-entries. It is possible for a Sullivan longwall mining machine, such as Mr. Pickett states he is using, to cut about 20 places in a single shift. But, in my opinion, by the proposed method of working, it will hardly be possible to keep that number of places going on a single heading, owing to the slow development.

To illustrate, let me say that two men work in two 25-ft. rooms and two entrymen are driving a 12-ft. entry and an 18-ft. air-course, asuming, for argument, that this is permitted under the agreement with the union. Now, assuming that both men mine and load an equal amount of coal, it is evident that the places will advance in the inverse ratio to their widths. This being the case, the total width of entry and air-course being 30 ft. and that of two rooms 50 ft., while the rooms are advancing 30 ft., the entries will advance 50 ft. Assuming that work is started in the first two rooms as soon as these are turned and that the rooms are to be driven, say 180 ft. from the point they are widened out, to the pillar flanking the next air-course, it is evident that the entrymen will be only 300 ft. in advance of the last room turned, when the first two rooms are finished. But such an advance will only allow for the turning of eight rooms on 40-ft. centers.

### A Beiter Plan Suggested

In my view, there are two exceptions to Mr. Pickett's present panel system. Let me suggest that, instead of turning cross-entries off the main entry on 1000-ft. centers, this distance be increased to 1200 ft. Then, allowing for 100-ft. pillars protecting the cross-entries on each side of this block, there will be room for driving 26 rooms on 40-ft. centers.

Again, let me suggest the driving of room headings off both entries of each pair of crossheadings. For example, the crossheadings being driven east and west, drive No. 1 and No. 2 N off the 2 E or 2 W, as the case may be, and also drive Nos. 1 and 2 S off the 3 E or 3 W to meet the corresponding entries driven north. In my opinion, this system would not only give ample room to keep the machines running at full capacity, but would expedite the recovery of coal from the last room on the heading, which is now difficult to secure. The system would also speed up development and reduce the cost of upkeep on roads and entries.

The chief disadvantage, in the method I have mentioned, is the increased length of haul on the entries driven south; but this objection is more than balanced by the rapid development and increased output of the mine.

In conclusion, I may say that our roof, in this vein, about 6 ft. above the coal, is impregnated with marsh gas and contains quite a little water. Instead of pulling pillars, therefore, every effort is made to avoid caving the roof; and, because the fireclay bottom yields readily to the softening action of water and heaves, it is important to keep the workings well drained by providing an adequate pumping equipment. MINER.

Sullivan County, Ind.

## Efficiency of Mine Officials

*Letter No. 10*—I have been greatly interested in the letters that have appeared recently in *Coal Age*, relating to the efficiency of mine officials. While I cannot say that I agree with everything that has been written, no doubt exists in my mind but that there is ample room for greater official efficiency in coal mining.

As remarked by Thomas Hogarth, in his excellent letter, *Coal Age*, Mar. 13, p. 504, "A good superintendent shows his ability by the foremen he employs." In Colorado, the state mining law compels the employment of a man as foreman, who holds a first-class certificate. It may chance, however, that the holder of such a certificate does not prove to be a good foreman. He may have the knowledge of what should be done, but not possess the ability to successfully direct his men and secure the best results.

When a foreman fails, the superintendent has an opportunity to show his own ability to supervise the work, as it is not always an easy task to displace a foreman after he has once been given charge of a mine, unless it should happen that the mine inspector would find fault with him.

Yes, the superintendent must not only select the right man to act as foreman, as Mr. Hogarth has said, but he must get the right kind of material and supplies for the mine, and know how to keep the men satisfied. In a word, he must possess the knowledge required to operate the mine in compliance with the law and get results.

Speaking of a superintendent's wearing a "white collar," to my mind, is not material to the question of his efficiency. The real work of a superintendent is to so organize and control his men as to get results. Our great General Pershing demonstrated *his* ability as an organizer and a leader of men. He was not the kind of man that would shoot a hole in a barn and paint a target around it, but by plugging a bull's eye in the target already painted he has proved his marksmanship. That's efficiency in any leadership, and gold medals and white collars cut little figure one way or the other.

### Examination for Superintendents

In the operation of coal mines, it is my honest opinion that superintendents should be compelled to pass an examination before a state mining board—not to say that that would make them more efficient as mine superintendents—but it is often necessary for a superintendent to act in the capacity of mine foreman, in the latter's temporary absence from the mine.

For a superintendent to act as mine foreman, however, would not be in compliance with the Colorado mining law, unless he was already in possession of a first-class mine foreman's certificate as required by law. It is true that our law, at present, grants a mine superintendent the privilege of acting as foreman if he can prove his ability to perform those duties; but it would save a lot of argument on this question if the law provided for the certification of superintendents.

Mention has been made of "a barber," in one instance, and "a grocer," in another instance, becoming efficient superintendents of large mines. In my opinion, it is the education and knowledge of the man that fits him for this position. One of the most successful superintendents in this part of the country was formerly a machinist. His education had taught him the general principles of mining, including surveying, reading of maps, and accounting of labor and supplies. This knowledge, together with his ability to organize and lead men, resulted in the coal coming out of the mine in a way that satisfied the men higher up.

I fully agree with the suggestions that have been made that the superintendent should have no favorites, but should treat all men alike and refer all complaints

to his foremen. A superintendent's interfering with a foreman's decision, or in other ways assuming the duties that are the foreman's can only do harm. It has often caused a good foreman to quit his place.

Let me say, in closing, that the mine officials' "Round Table," for the discussion of matetrs pertaining to mining, is a great factor in increasing official efficiency. A man with 90 per cent. brains and 10 per cent. common sense cannot prove efficient in a mine; he must have 50 per cent. brains and 50 per cent. common sense, and the round table helps to make such men. It is there that John Jones can show Jack Smith his method of calculating a switch; while John Smith, in turn, will show his friends how that switch must be laid in the mine.

In the monthly or semimonthly meetings of the mine officials, the efficient superintendent will lead in all discussions, and thus be able to develop the best thoughts and ideas of each man present, and give to all the same aim and object. It has been my good fortune to come in contact with superintendents of this class, who appreciate the suggestions of their men concerning any improvement in the getting out of the coal.

Farr, Colo. ROBERT A. MARSHALL.

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*Letter No. 11*—After reading with deep interest the letter of J. T. Jones, *Coal Age*, Mar. 20, p. 548, I beg to differ with him in regard to the opinion he has expressed that coal operators only consider that official efficient who produces a large tonnage of coal at a low cost of operation, without regard to the actual conditions surrounding the work.

Observation has led me to believe that coal operators and the higher officials of companies, today, know just what conditions are confronting their men in charge of the underground work. To me at least, it is inconceavable that any intelligent officer of a large coal company will expect a man whom he has placed in charge of a mine where he knows there are peculiar difficulties to be encountered, to make the same showing that is made in another mine that is reaping the harvest of its palmy days.

It is my belief that the management of coal mines determine the efficiency of their under-officials in accordance with the results they are able to produce in varying conditions. They are fully aware that coal can be produced with greater economy and safety in some mines than in others. From the abundance of literature published by mining companies on "Safety First," it is quite evident that it is the honest purpose of the management to keep their mines in a safe and healthful condition while producing a maximum tonnage at a minimum cost. Their plans and instructions show that due consideration is given to the lives of their men and the protection of property.

### EFFICIENCY SHOWN BY ABILITY TO PERFORM

The proof of efficiency on the part of any mine official is readily estimated by observing the manner in which he meets the difficult problems that are constantly being presented in the operation of a mine. Contrast, for a moment, two officials in charge of mines working under widely different conditions. Let us say that the superintendent, at one of these mines, has been fortunate enough to break all preceding records in the daily output of the mine. At this juncture, however, he is suddenly puzzled by conditions that have developed underground, regarding a heavy squeeze, which threatens to close an entire section of the mine; or it may be an unexpected outburst of gas occurs in a portion of the workings. Suppose, now, that the superintendent's lack of practical experience in handling either of these conditions renders him helpless to cope with the present situation, the mine would then be forced to suspend operations for a time or until the difficulty can be overcome.

Compare the instance just cited with the situation at another mine where the superintendent is not only capable of producing a fairly high daily tonnage, but has, besides, the ability to safely handle all the difficult problems that are liable to arise in the mining of coal. In comparing these two cases, one can see plainly that the more efficient foreman or superintendent is the one last named. With such a man in charge, there is no need of going outside the organization for assistance to insure the safe operation of the mine.

The casual onlooker can readily determine the relative degree of efficiency of two or more officials in charge of mines, by observing how often or how seldom they are taken to task by the management for the results obtained. The more frequent visits of the higher officials to some mines than to others shows their greater anxiety in the one case than in the other; or it may reveal a greater lack of confidence in the men in charge of the one mine than in those at the other mines.

### OBSERVATIONS OF A GENERAL MANAGER

My attention was called to this fact through a conversation with a general manager of a large coal company. In speaking about the visits he paid to his different mines, he said, "It all depends on the colliery superintendent and foreman. I am very proud of the team of officials I have at ——— mine, because I know that everything must be all right with them, as their production shows it and the amount of supplies consumed is very low."

"Moreover," he continued, "the mine inspector's reports were such that I had to sit up and take notice. Just think of it—not a man has been injured in that mine for a whole year; and the report of men being idle, owing to unfavorable or unsafe conditions in the mine, is lower than at any other colliery the company operates."

From these statements, it appears to me that "efficiency" should be the middle name of the superintendent and foreman of the mine just mentioned. It is apparent that they are men who are constantly observing and trying to improve conditions bearing on the daily production of the mine, as well as improving the working conditions, which is and always should be the most important item in every industry, and is generally known as the "conservation of man power."

Allow me to close, then, by saying that the true efficiency of mine officials must be determined by taking into consideration something more than their ability to produce a large tonnage at low cost. Any broad-minded manager, in discussing the efficiency of his under-officials, will ask, "How are they producing the coal? What conditions are the men working under? What evidences are there that the men are satisfied?" The answer to these questions will determine the degree of efficiency of the men in charge at the mine.

Plymouth, Penn. JOSEPH R. THOMAS.

[This letter will close the discussion on "Efficiency of Mine Officials"—EDITOR.]

# INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

## Effect of Hoisting on Ventilation

We have under consideration, at the present time, a proposition regarding which I would like to have an expression of opinion, by *Coal Age* and readers who have had actual experience in a matter such as I am about to mention.

The upcast shaft, at our mine, is 10½ x 16½ ft. in section and 360 ft. deep. The air current passing up this shaft has a velocity of 1000 ft. per min. It is proposed to equip this shaft for hoisting coal and to employ self-dumping cages for that purpose. The bottom area of each cage will be 6 x 10 feet.

In turning over this proposition in my mind, the question has arisen, What effect will the movement of the cages in the shaft have on the quantity of air in circulation in the mine? It is estimated that the proposed tonnage of this mine will require making 1000 dumps in 8 hours, which will necessitate hoisting at the rate of 30 ft. per sec. I want to ask if this arrangement will interfere with or tend to lessen the quantity of air that is now passing up this shaft. OPERATOR.

Pittsburgh, Penn.

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This is a question that has often been asked and must be answered with due regard to the existing conditions. The correspondent has given the sectional area of the shaft and the area of the bottom of each cage, and it is clear that this is a double hoistway, one cage ascending as the other descends the shaft. He has not stated, however, whether the floor of the cage is solid or formed of slats or bars that would permit the passage of air through the floor and present less obstruction to the air current.

Again, it is not stated what form of partition divides the two hoistways, whether this is made of solid planks completely separating the two compartments of the shaft, or whether cross-buntons are used, spaced at wide intervals apart. These details have an important bearing on the question of what effect the movement of the cages in the shaft will have on the circulation of air in the mine.

It is the experience of the editor, in the operation of a mine in the west where a double-compartment hoisting shaft was used as an upcast for the mine and there was ample room between the cages and the shaft curbing and the bottoms of the cages were slatted that there was no perceptible obstruction to the air current passing up the shaft. But, in that case, the two compartments of the shaft were separated by an open partition formed of buntons spaced six feet apart.

In another instance, where the cages fitted quite snugly in the shaft and the compartments were separated by a solid partition wall of planks, the effect on the circulation was such as to necessitate opening the bottoms of the cages and removing many planks from the partition in the shaft.

Theoretically, in a double-compartment hoisting shaft, the air is churned back and forth between the two compartments, as the two cages act alternately to retard and to assist the flow of air, up the shaft, which would suggest that the result of the moving cages on the circulation in such a shaft is *nil*.

Practically, however, it can be said that everything depends on the open partition and the amount of space between the cages and the shaft-curbing. The latter appears to be ample in the case presented in the inquiry of this correspondent.

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## Laying a Room Switch

Kindly describe the manner of locating a frog on an entry when laying a room switch where the rooms are turned at right angles to the entry, and say how far back on the entry should be the point of switch.

What number of frog should be used in laying such a switch where a gathering motor is to be used and it is necessary to take the motor to the faces of the rooms? Is there any formula that will give the dimensions necessary in laying this switch? W. G.

———, Penn.

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It is common mine practice to use a No. 3 frog in laying a room switch where the room is turned at right angles to the entry. When the switch is properly laid, and the track well ballasted, a gathering motor will pass over this frog without difficulty.

Start by sliding the frog along on the near rail of the entry, to such a position that there will be a good clearance for the car at the corner where the outby rib of the room intersects the rib of the entry. This corner can be rounded to a considerable extent, ordinarily, without endangering the support of the roof over the roadway. The distance from this rounded corner to the point of frog must be equal to half the gage of the track, plus half the width of the car, plus the desired clearance.

Thus, allowing a clearance of 6 in., the width of the car being 5 ft. out to out, and the track gage, 3 ft., the distance from the coal to the point of frog must be 4½ ft. In a 10-ft. entry the point of frog will generally be about on line with the outby rib of the room. Rounding the corner will assist in reducing the sharpness of the curve passing into the room, beyond the frog.

The distance to be measured back on the entry, from the point of frog to the point of switch, is usually taken as equal to twice the gage multiplied by the number of frog. Thus, for a 3-ft. gage and a No. 3 frog, the distance would be $2 \times 3 \times 3 = 18$ ft. This is practically the length of the lead rail of the switch and the middle ordinate of this curved rail is about 9 in.

After passing the frog, the curvature of the rails must be increased to enable the car to clear the inside rib, in the mouth of the room, and bring the room track in line with the straight rib. There is no formula for calculating the amount of this curvature, which can only be determined on the ground, by making the curve as uniform as possible.

# EXAMINATION QUESTIONS

ANSWERED BY JAMES T. BEARD

## Miscellaneous Questions

*(Answered by Request)*

*Ques.*—The total ventilating pressure in a mine, the sectional area of which is 48 sq.ft., is 374.4 lb.; what is the reading of the water gage?

*Ans.*—The sectional area of the airway being 48 sq.ft., the unit of ventilating pressure is 374.4 ÷ 48 = 7.8 pounds per sq.ft. and, since 1 in. of water gage corresponds to a presure of 5.2 lb. per sq.ft., this pressure will give a water-gage reading of 7.8 ÷ 5.2 = 1.5 in.

*Ques.*—The volume of air passing through a mine is 150,000 cu.ft. per min. A test of the return air shows 0.35 per cent of methane; what amount of gas is given off in 24 hr., assuming conditions to remain unchanged?

*Ans.*—From the reading of the question, it must be assumed that the circulation given is the quantity of air entering the mine. Then, since the test of the return air shows 0.35 per cent. of methane, the proportion of fresh air in that current is 100 — 0.35 = 99.65 per cent. Therefore, 150,000 cu.ft. is 99.65 per cent. of the return current, and the total quantity of air and gas in the return is 150,000 ÷ 0.9965 = 150,268 cu.ft. per min. The quantity of gas given off each minute is, then, 150,268 — 150,000 = 268 cu.ft., and the quantity generated in 24 hr. is, therefore, 268 × 60 × 24 = 385,920 cu.ft.

*Ques.*—(a) What is meant by horsepower on the air? (b) If the volume of air entering a mine under a 2-in. water gage is 84,615 cu.ft. per min., what is the horsepower on the air?

*Ans.*—(a) The horsepower on the air is the total effective work concerned in producing the circulation of the air current, estimated on a basis of 33,000 ft.-lb. per min. as the equivalent of one horsepower.

(b) The effective work performed in the circulation of an air current is equal to the quantity of air passing, in cubic feet per minute, multiplied by the unit pressure or the pressure per square foot producing the circulation. In the case given, the effective work is 84,615 × 2 × 5.2 = 879,996, say 880,000 ft.-lb. per min., and the horsepower on the air 880,000 ÷ 33,000 = 26⅔ hp.

*Ques.*—An anemometer registers a velocity of 30,000 ft. per hr., in an airway 5 x 8 ft. in section. What is the volume of air passing per minute, and how will you ascertain whether the anemometer is in good working order?

*Ans.*—The velocity given as 30,000 ft. per hr. is 30,000 ÷ 60 = 500 ft. per min. The sectional area of this airway is 5 × 8 = 40 sq.ft., and the quantity of air passing is therefore 500 × 40 = 20,000 cu.ft. per min.

In order to ascertain the correctness of the anemometer, it should be sent to the factory where it was made, to have its calibration checked in an accurate manner. A rough test may be made in the mine by selecting a straight and uniform stretch of airway and applying the smoke test.

A distance of 100 yd. is first measured along an airway in which a fair quantity of air is passing. The operator, holding the instrument at the intake end of this measured distance, sets off a little flash of powder, while an observer at the other end of the measured distance notes the exact time between observing the flash and the first smell of powder that reaches him, and signals the operator. The latter then takes the exact reading of the instrument, which should correspond to the distance measured if the instrument is correct.

*Ques.*—In a lever safety valve, the whole length of the lever is 30 in., the distance from the fulcrum to the valve stem, 3 in., diameter of valve 2 in.; what weight must be put at the end of the lever to have the valve blow off at a pressure of 40 lb. per sq.in.? Also, where should this weight be hung on the lever so that the valve will blow off at 30 lb. and again at 20 lb. per sq.in.?

*Ans.*—The area of the valve is $0.7854 \times 2^2 = 3.14$ sq.in. For a pressure of 40 lb. per sq.in., the total pressure on the valve is $40 \times 3.14 = 125.6$ lb. Now, to ascertain what weight will be required on the end of the lever to balance this pressure, it is necessary to apply the principle of moments, which makes the product of the weight ($W$) into the length of the lever equal to the product of the total pressure on the valve into the distance of the valve stem from the fulcrum. Thus,

$$30\ W = 3 \times 125.6 = 376.8$$
$$W = 376.8 \div 30 = 12.56 \text{ lb.}$$

Again, to find the distance this weight must be hung from the fulcrum, in order that the valve shall blow off at 30 lb. per sq.in., we have by the same principle of moments, calling the required distance $x$,

$$12.56x = 3(30 \times 3.14) = 282.6$$
$$x = 282.6 \div 12.56 = 22\tfrac{1}{2} \text{ in.}$$

For a blow-off pressure of 20 lb. per sq.in., we have

$$12.56x = 3(20 \times 3.14) = 188.4$$
$$x = 188.4 \div 12.56 = 15 \text{ in.}$$

*Ques.*—A fan driven by two coupled engines, having cylinders 18 in. in diameter, length of stroke 42 in., number of strokes 50, with 16.8 lb. pressure, giving 80 hp. and circulating 144,055 cu.ft. of air per minute gives an actual water gage of 3 in. Find the theoretical water gage.

*Ans.*—Assuming that this duplex engine, having the given dimensions and running at the given speed, under a mean-effective pressure of 16.8 lb. per sq.in., is developing 80 hp. when circulating 144,055 cu.ft. of air per minute, the theoretical water gage would be

$$w.\ g. = \frac{33{,}000H}{5.2Q} = \frac{33{,}000 \times 80}{5.2 \times 144{,}055} = 3.5 \text{ in.}$$

[Taking the given pressure as the mean-effective pressure in the cylinder, a duplex engine, having the above dimensions and speed, would develop only 45 hp., making no allowance for efficiency.

$$H = \frac{16.8 \times 3\frac{1}{2}\ (0.7854 \times 18^2)\ 50 \times 2}{33{,}000} = 45+ \textit{ hp.}$$

As a matter of fact, in this case, however, the horsepower developed for driving the fan being given, the dimensions and the speed of the engine do not enter the solution and are misleading, owing to the fact that they do not give the horsepower mentioned.—Editor.]

# FOREIGN MARKETS AND EXPORT NEWS

EDITED BY ALEX MOSS

## Coal Shipments to Scandinavia and Holland

The War Trade Board on May 14 announced that henceforth applications will be considered for licenses to ship coal to Norway, Sweden, Denmark or Holland without requiring the importer to procure an import certificate. Applications for such licenses should be filed with the War Trade Board, Washington, D. C. The details of these applications will be cabled to the Inter-Allied Trade Committee in the country of destination, and with their approval a license will be issued. Under the foregoing ruling, shipments of coal need not be consigned to any association, but may be made directly to individuals in the countries of destination.

## Larger Exports of New River Coal

Mine owners operating in the New River district gave it as their opinion that there would continue to be a larger amount of coal exported during the next few months than had been possible in the last few monthly periods, stating that during the week ending May 10 there had been a large increase in the tonnage shipped to tidewater for consumption in European countries. The statement was also made by New River operators that ships were somewhat easier to obtain than had heretofore been the case, that being attributed to the fact that not so much food was now being exported and that ships had been released for the carrying of coal for which there was an urgent demand in certain countries overseas.

## English Coal Market

Business, in a general way, has been virtually suspended in the various coal markets, states the *Iron and Coal Trades Review* of Apr. 25, and under the prevailing holiday influence the few movements recorded have had little bearing on future trade prospects. Owing to lack of production in the Tyneside area, the outlook for neutral customers shows no improvement as to prospects of supply, and although orders are being steadily booked, buyers have to take the risk of getting deliveries.

In Yorkshire and the Midlands production has been well maintained, and the railways have taken full advantage of the larger tonnage available to add to their stocks. There are expectations that the embargo on exports may soon be removed, and the strong inquiry for the allies and the neutral countries should develop into an active demand for district hards. The demand for all classes of small steam sizes is active, but supplies are short. Nut slacks are also in good request, but it is impossible to obtain extra lots with the distribution so closely controlled. The better supply of domestic coal has enabled good deliveries to be sent, both to London and the nearer markets. The quieter demand for furnace coke is still experienced, but the position is met with a reduced output, which is readily disposed of.

the **South Wales district** there is very little doing on both the anthracite and steam coal markets, as the majority of the collieries are not at work.

The Scotch coal trade is still very fully employed, although there is not the same pressure as has been the case recently. Export business all round is still very much restricted on account of the difficulty of obtaining licenses. Steamers are kept waiting for cargoes a long time.

## Shanghai Coal Market

Under date of April 10, 1919, Wheelock & Co. report that there has been little or no business in Japanese coal in Shanghai for some time. The only thing worthy of remark, according to the report, is the large number of arrivals bringing in over 67,000 tons of coal, which is apparently the result of the cheaper freight now ruling. In Japan quite a lot of business has been done in the commoner kinds of coal for industrial use, and this has had the effect of hardening prices on this class of fuel.

The spot demand for Fushun coal has grown considerably of late and it is therefore becoming increasingly difficult to supply the demand for export.

Owing to requisitioned vessels being released by the British Government it has been possible to reduce quotations on Kaiping coal, and such reduction has been extended to present contractors. The demands for the better grades exceed the supply, consequently prices for these coals are very firm.

## Coal Situation in North China

*[North China Star]*

The five northern coal-producing provinces of Manchuria, Chihli, Shantung, Shansi and Honan yield about 60 per cent. of the total output for China. Present consumption of coal in the northern provinces is small, the annual consumption being one twenty-fifth of a ton per capita, as against 3½ tons per capita in America. Demand for fuel for household and industrial purposes is steadily increasing in China as the standard of living rises.

Manchurian coal does not come into other provinces of China on account of prohibitive freight rates. In Chihli, mines near Chinwangtao produce anthracite which sells at $13 to $14 a ton in Tientsin. Estimated cost of production, $6.50. The Kailan Mining Administration near Tangshan sells coal in Tientsin at $7.50 a ton. Cost of production, including freightage, about $3.20. The Min Tou Kou coal fields, west of Peking, where there are two companies operating on modern lines, produce second-class anthracite selling at $9 and over. Cost to Tientsin, about $2.30.

Bituminous and anthracite coal are also shipped to Peking from mines along the Peking-Hankow and Shih Chia Chuang railways. There are many small coal mines operated by natives in this district supplying local demand. Along this route is the Ching Hsing mine, a former German property, acquired by Japan, which supplies a Chinese railway car company with coal.

The Peking Syndicate, one of the most important concessions in China, sells coal at $18 a ton to Peking and Tientsin.

Deposits of coal in Shantung Province, while not so good quality as in Shansi, are easily worked and have foreign machinery. These mines supply local demand along the Tsin Pu Railroad.

## Exports of Coal and Coke During March, 1919

| Districts: | Anthracite Coal, Tons | Bituminous Coal, Tons | Coke, Tons |
|---|---|---|---|
| Maine and New Hampshire | ..... | 3,401 | 28 |
| Vermont | 796 | 780 | ..... |
| Massachusetts | 140 | 1,450 | ..... |
| St. Lawrence | 29,011 | 55,699 | 529 |
| Rochester | 1,268 | 19,450 | 269 |
| Buffalo | 73,285 | 154,601 | 11,362 |
| New York | 904 | 140 | 390 |
| Philadelphia | 3,851 | 10,845 | ..... |
| Maryland | ..... | 25,835 | 2,333 |
| Virginia | 6,675 | 149,928 | 163 |
| South Carolina | ..... | 6,120 | ..... |
| Florida | 1,317 | 60 | ..... |
| Mobile | ..... | 2,090 | ..... |
| New Orleans | ..... | 1,733 | 25 |
| San Antonio | 411 | 1,042 | 2,801 |
| El Paso | ..... | 1,094 | 2,369 |
| Arizona | ..... | 746 | 6,736 |
| Southern California | ..... | 21 | ..... |
| San Francisco | ..... | 50 | 404 |
| Washington | ..... | 358 | 124 |
| Dakota | 39 | 3,888 | 107 |
| Duluth and Superior | 108 | 1,871 | 23 |
| Michigan | ..... | 87,094 | 5,555 |
| Ohio | ..... | 25,741 | 531 |
| Total | 117,805 | 554,037 | 33,749 |
| Countries: | | | |
| France | ..... | ..... | 274 |
| Italy | 6,675 | 17,197 | ..... |
| Netherlands | ..... | 26,743 | ..... |
| British Honduras | ..... | 90 | ..... |
| Canada | 105,093 | 352,883 | 18,528 |
| Costa Rica | ..... | ..... | 12 |
| Guatemala | ..... | 105 | 20 |
| Honduras | ..... | 464 | 5 |
| Nicaragua | ..... | 247 | ..... |
| Panama | ..... | 5,290 | 6 |
| Salvador | ..... | 2,242 | 2 |
| Mexico | 411 | 5,429 | 12,316 |
| Newfoundland and Labrador | 140 | ..... | ..... |
| Barbados | 25 | 15,196 | ..... |
| Cuba | 5,173 | 38,107 | 165 |
| Dutch West Indies | ..... | 1,146 | ..... |
| French West Indies | ..... | 4,709 | ..... |
| Dominican Republic | 288 | 497 | 10 |
| Argentina | ..... | 8,670 | 229 |
| Brazil | ..... | 60,296 | 77 |
| Chile | ..... | 6,934 | 776 |
| British Guiana | ..... | 1,939 | ..... |
| Peru | ..... | 2,187 | 1,329 |
| Uruguay | ..... | 3,660 | ..... |
| Venezuela | ..... | 6 | ..... |
| Total | 117,805 | 554,037 | 33,749 |

BUNKER COAL

| | |
|---|---|
| Maryland | 28,636 |
| New York | 154,527 |
| Philadelphia | 39,853 |
| Virginia | 143,735 |

The governments of Great Britain and Spain have recently concluded an agreement under which the former allows the export of at least 150,000 tons of coal per month to Spain; the quantity will depend on the available shipping and on the cost of freights.

The imports of coal into Egypt during 1918 totaled 501,780 metric tons, as against 461,987 such tons in 1917 and 916,509 tons in 1916.

## Hampton Roads Coal Exports

NORFOLK

| | | | | Cargo | Bunkers |
|---|---|---|---|---|---|
| Lambert's Point | | | | | |
| May | 6 | Amer. S.S. Basaan | Pernambuco, Brazil | 2,487 | 819 |
| May | 6 | Ital. S.S. Titania | Gibraltar FO (Italy) | 4,743 | 526 |
| May | 9 | Amer. S.S. Sudbury | Gibraltar FO (Italy) | 6,049 | 740 |
| May | 9 | Amer. S.S. Oregonian | Rio de Janeiro, Brazil | 6,705 | 1,421 |
| May | 10 | Nor. S.S. Harriet | St. Georges, Bermuda | 2,062 | 268 |
| May | 10 | Nor. S.S. Port Antonio | Port Limon, Costa Rica | 1,111 | 59 |
| Sewall's Point | | | | | |
| May | 5 | Swed. S.S. Hermes | Havana, Cuba | 2,255 | 155 |
| May | 6 | Amer. S.S. Lake Butler | Santiago, Cuba | 1,392 | 411 |
| May | 6 | Amer. S.S. Tuckahoe | Rio de Janeiro, Brazil | 4,185 | 824 |
| May | 7 | Nor. S.S. Negus | Pernambuco, Brazil | 3,696 | 839 |
| May | 9 | Amer. S.S. Bay View | Havana, Cuba | 2,118 | 286 |
| May | 9 | Amer. S.S. Port Lobos | Rio Grande do Sul, Brazil | 2,807 | 0 |
| May | 10 | Nor. S.S. Kronstad | Rio de Janeiro, Brazil | 4,000 | 1,456 |
| May | 10 | Amer. S.S. Guildford | Venice, Italy | 2,607 | 200 |
| Newport News | | | | | |
| May | 3 | Nor. S.S. Heina | Rio de Janeiro, Brazil | 3,765 | 1,304 |
| May | 5 | Br. S.S. Justin | Pernambuco, Brazil | 1,039 | 1,231 |
| May | 7 | Amer. S.S. Lake Copley | St. Lucia, B. W. I. | 2,950 | 365 |
| May | 8 | Am. Sch. Carroll A. Deering | Rio de Janeiro, Brazil | 3,505 | ..... |
| May | 8 | Amer. S.S. Lake Orange | Antilla, Cuba | 2,448 | 299 |

# COAL AND COKE NEWS

## What Happened in April

[The bracketed figures in the text refer to the number and the page of the volume in which references to the matter noted may be found and should the reader desire further information he can obtain it in the place indicated.]

Apr. 1—Frank J. Hayes, president of the United Mine Workers of America visits the White House and announces that his purpose is to call on President Wilson in Paris and urge his coöperation in the securing of increased sales of American coal in Europe.--West Virginia celebrates the second anniversary of the establishment of an eight-hour day for the miners of the state, at Rivesville, W. Va. F. C. Keeney, president of District No. 17, delivers an address [XV, 720].

Apr. 2—It is reported that a United States exporting firm has obtained an order for 4,000,000 tons of coal in Italy—Director General Hines of the Railroad Administration refuses to pay "stabilized" prices for rail—Southern pine lumber manufacturers refuse to "stabilize" their prices.

Apr. 3—The Anthracite Coal Operators' Association holds its annual meeting at the Bellvue-Stratford hotel in Philadelphia, Penn., electing officers [XV, 775] —The annual meeting of the Canadian Associated Coal Dealers is held at Toronto, Ontario, when the coal situation was fully discussed. Officers were elected and resolutions adopted [XV, 732]—D. E. Adams, a leading coal merchant of Winnipeg, Manitoba, dies at Pasadena, Cal. [XV, 733].

Apr. 4—Governor Sproul of Pennsylvania declares increase in anthracite prices is justified, attacking, however, railroad rate inequalities and retail delivery charges. He also urges public fuel markets.

Apr. 8—The air shaft at the Harry E. colliery of the Forty Fort Coal Co. is destroyed by fire, endangering the lives of 50 men underground. On the evening of the same day, the washery of the Red Ash Coal Co is burned. Its value was about $100,000 [XV, 774].

Apr. 9—President John Braphy, of Central Pennsylvania or No. 2 district of the United Mine Workers of America, protests against the terms of the anti-sedition bill [XV, 836]—The Government files its brief in the Supreme Court of the United States in the case of the United States vs. the Lehigh Coal and Navigation Co. The case revolves around a payment of rebates [XV, 714].

Apr. 10—George N. Peek, on behalf of the Industrial Board of the Department of Commerce, denies that statement of Walker D. Hines, Director General of Railroads, to the effect that the stabilized prices of steel are too high.

Apr. 11—J. L. Lewis, acting president of the United Mine Workers, declares that the miners' organization will take drastic action unless Director General Hines changes his policy in regard to making coal contracts [XV, 773].

Apr. 12—The National Retail Coal Merchants' Association meets at the Fort Pitt hotel in Pittsburgh, Penn., and resolves to seek representation in Government schemes of distribution during reconstruction period and to encourage early buying of coal [XV, 773].

Apr. 13—The workers of the Clinton, Indiana, coal field show their approval of the attitude of the executive board of District No. 11 which protested against a cut in the price of coal to W. D. Hines [XV, 762]—The Victory Loan drive begins at 12 o'clock midnight.

Apr. 15—Director-General Walker D. Hines instructs the individual railroads that they must give all information as to tonnage in coal contracts to the mine workers' officials in the Pittsburgh district—The Jeanesville and Yorktown collieries of the Lehigh Valley Coal Co. start work after an idleness lasting since last February [XV, 774].

Apr. 16—The Miners' Confederation of Great Britain and Ireland meet in conference and approve by a large majority the report of the Sankey Commission [XV, 762]—All of the mines of the Central Coal and Coke Co., at Pittsburg, Kan., are idle, the 1200 miners not reporting for work following the strike order of the district president [XV, 762].

Apr. 17—Back wages under the Sankey award, approximating $25,000,000, are paid out by operators in Great Britain, by order of the Coal Controller, to virtually all of 900,000 workers in the mines of the United Kingdom. The back wages represents an advance of about 25c. per shift worked for employees under 16 and 50c. per shift for employees over 16, applied from Jan. 9, to Apr. 17.

Apr. 18—The strike of the coal workers in the Kansas, Arkansas and Oklahoma fields is extended by Alexander Howat, president of District No. 14, into Missouri. About 6000 men are now involved [XV, 823].

Apr. 19—The New York harbor strike, in its eighth week, is settled under an agreement reached at a meeting presided over by Mayor Hylan, by which the men return to work on a permanent 10- and 12-hr. day basis leaving the increase in wages to be settled by a committee of four representatives of the boat owners and four representatives of the strikers.

Apr. 20—Dr. H. A. Garfield threatens to revoke provision of agreement of November, 1917, unless Howatt orders striking miners of the Central Coal and Coke Company to return to work [XV, 762].

Apr. 22—Representatives of anthracite and bituminous coal producers of Pennsylvania enter protest against any increase in workingmen's compensaion at the second conference on the suggested amendments held at the state capital. Representatives of the miners support the amendment [XV, 835]—The resignation of the members of the Industrial Board, George N. Peek, chairman, is accepted. This action followed the failure of the conference arranged by the board between the representatives of the steel industry and those of the Railroad Administration—The Supreme Court of Pennsylvania decides that where employees of a coal company are sent to a hospital for treatment for injuries, by permission of a company, the latter is responsible for payment of the bills [XV, 884].

Apr. 23—President Wheelwright, of the National Coal Association, appoints a foreign trade committee of seven members to consider the formation of an export association under the Webb-Pomerene law for the coal industry. T. V. Farrell, of the Pocahontas Fuel Co., is chairman of the committee.

Apr. 24—The staff that supported Dr. H. A. Garfield in the work of the Fuel Administration holds a dinner in Dr. Garfield's honor at the Waldorf-Astoria, New York City. Dr. Garfield is presented with a bronze statuette [XV, 868].

Apr. 25—The child-labor provisions of the new revenue bill become effective and will tend to stop the employment of boys under 16 years of age in or about mines in any capacity. Violation of this law will subject the employer's business to a tax of 10 per cent.

Apr. 26—The strike of the 6000 mine workers of the Central Coal and Coke Co. is settled on the agreement that the mining machines and loaders start simultaneously [XV, 917].

Apr. 28—A company of militia is dispatched to Linton, Ind., when the mine workers quit work apparently to aid in an attempt to intimidate certain strike-breaking telephone girls whom the Central Labor Union was said to be planning to deport [XV, 823]—On the initiative of Robert Smillie, president of the Miners' Federation, the Government commission investigating the question of nationalizing the coal mines, subpoenaes seven coal owning peers. The coal owners will be questioned about the income or royalties they derive from their coal properties.

Apr. 29—Several hundred coal miners remain away from work in the Linton, Ind., district, adding to the disturbance started the day before. Federal officials order another company of militia from Bloomington [XV, 917]—A gas explosion in the Regal mine of the Majestic Coal Co., of Alabama, results in the death of 21 employees [XV, 885].

Apr. 30—Proposals looking to a special form for a bill of lading for coal shipments are dismissed by the Interstate Commerce Commission. It is believed that the uniform bills prescribed will be adequate to care for any peculiar requirements of such traffic [XV, 912].

## Harrisburg, Penn.

Senator Davis of Lackawanna County has introduced a bill that will provide for the establishment of a Pennsylvania Anthracite Mine Cave Commission modeled after the plan of the Public Service Commission. The commission, consisting of a chairman and three members, at a salary of $5000 annually, to be appointed by the Governor.

The new measure requires every operator to accept or reject at his option the jurisdiction of the commission. If the operator or the corporation accepts, an annual sum equal to 1 per cent. of the gross value of all coal mined during the preceding year must be paid. Making this feature optional on the part of the operator eliminates the coal tax constitutionality question.

Every operator who accepts the jurisdiction of the commission is privileged to make application for permission to mine under streets and structures protected by law, and if the commission determines that no serious damage to life or great public harm will result, permission to mine will be granted, and the operator will not be liable for any penalties under the Davis bill, now in committee, or any act now existing.

The fund raised by the voluntary contribution section will be expended by the commission to pay all damages resulting from mine caves of every nature. This will mean 100 per cent reparation. In certain cases the money can be spent to prevent surface subsidence by erecting artificial support. Any person who is dissatisfied with any order of the commission may appeal to the courts under the same terms as an appeal is taken from the rulings of the Public Service Commission.

The operator, the measure provides, must take some affirmative action in regard to rejecting or accepting the jurisdiction of the commission. If he does not file his rejection in six months he is bound by the act. No new corporation shall be authorized to mine anthracite coal except on its agreement to come within the terms of the act.

The coal companies will be allowed under the provisions of the bill to cave-in the surface if such action does not endanger the lives of the public or cause great public inconvenience.

## Uniontown, Penn.

Merchant operators of the Connellsville coke region seem to have reached rock bottom in their curtailment policy, but furnace interests continue to add ovens to the idle list. Five hundred ovens last week were put out of operation by the H. C. Frick Coke Co., but there is no confirmation in coke circles here of the report in the steel trade that the Frick company was contemplating a 60-day suspension of operations. On the contrary, ovens are now being banked for a week instead of being blown out, that fact being taken here to mean that officials are expecting an increased demand for coke at any time and

can more quickly increase production with ovens banked than with them dead. There were no more ovens blown out by the merchant operators during the week.

To what extent the operation of the by-product plant at Clairton has influenced the development of coal tracts in the upper Monongahela Valley is reflected in the report of lockages through lock No. 6 for April, which show that 10,297,000 bushels of coal was shipped down the river. Before the Clairton plant was built the coal traffic from the uper pools was negligible, although it had been developed to a high degree in the fourth and fifth pools. The Carnegie Steel Co. now has five steamers making daily trips to and from the sixth pool. By July 1 the Carnegie company hopes to have a number of other boats added to its fleet, and is said to be contemplating the doubling of river shipments to meet the increasing demands of the byproduct plant.

Inability of coke producers and consumers to reconcile their respective viewpoints as regards price made a sluggish coke market during the week ended May 17, which, however, is still strongly in favor of the producer. Consumers are offering from $3.75 to $3.90 for furnace coke, but producers are balking at anything less than $4. As a result of that condition there is now more than 500 cars of coke standing on track awaiting destination. On the week ended May 10 the region was virtually cleared of loose tonnage by a Pittsburgh steel interest being forced into the open market for its fuel supply by reason of a strike at its mines. The third cargo of foundry coke for South America, gathered in the Connellsville region since April 1, was collected recently and sent to the seaboard for export.

## Charleston, W. Va.

For the first time in the last six months production has reached fully 100 per cent. in this territory; this statement is not applicable to the Kanawha district as much as to the New River field which is again being operated to capacity and the mines running steadily each week. That was the condition of affairs on May 15 and there was nothing to indicate that there would be any future slumps. Several factors operated to bring the output up to the capacity of the mines, one source of improvement being a much more fully developed export demand with sufficient ships to meet such orders as New River producers were able to handle; poor shipping facilities having heretofore retarded the shipment of a larger tonnage to foreign markets. Simultaneously with the increased export of coal was a better movement to lake points, although the shipments to such points have been increasing for the last few weeks, or since about April 20. Under such encouraging conditions about 200,000 tons of coal a week is being produced in the New River region. Difficulty has been encountered, however, in getting enough labor to man the mines so as to produce a capacity output, the shortage of miners being in the neighborhood of 25 per cent. This, however, is being overcome to some extent but labor will be scarce, it is predicted, within a short time. The increased demand for smokeless coal has of course had a tendency to make prices firmer and in fact to advance them somewhat, but slack is still selling below former levels and will continue to be sold at such figures until some of the present accumulation is disposed of.

Kanawha mining conditions had undergone a gradual improvement up to May 14, though production was practically at a standstill until the first of the month. Between the dates mentioned however, inquiries became more numerous and lake orders more plentiful; still even up to May 14, it is doubtful if the output of Kanawha mines was in excess of 50 per cent. of normal, mines not being in operation more than three days a week. Mine owners, as a rule, have been waiting to secure better prices before signing contracts. With the general market for coal much better, it is believed they will be able to command higher prices for their coal, and that in the near future they will be getting out coal on a larger scale.

## Fairmont, W. Va.

Impetus was given to production in northern West Virginia to such an extent during the first half of the month that by May 15 the output of the mines in the northern part of the state was rapidly approaching capacity. In fact, by the date given, daily shipments had reached over 800 cars a day as against an average of between 500 and 600 cars a day for the latter part of April. Marked gains in the shipment of fuel for railroad consumption were scored during the week ending May 15 as against the first seven days of May. Such shipments constitute nearly a third of the total outgoing tonnage, although there had been quite a substantial growth in lake tonnage during the period above referred to; the total number of cars of coal to the lake from the opening of the lake season to May 8 having been almost 2000 cars. At the same time export shipments were steadily on the increase, as indicated by the growing number of cars going to Curtis Bay, a number of mines having been at work on export orders for the last month. The mines shut down had decreased in number as had the number of unconsigned coal loads on hand. Furthermore the number of cars supplied had dwindled by May 15 from 3000 to 1700 a day; the supply on the date given was still ample for the needs of the district, though it was apparent that a car shortage would develop in the near future.

## Canada

**Alberta**—Judging from the returns showing the amount of coal mined in this province for the first three months of 1919, John T. Stirling, Chief Inspector of Mines for the province, estimates that there will be a decrease in the output for the year of about one million tons. The total production for the first quarter of 1919 was 1,424,683 tons as compared with 1,663,308 tons for the corresponding months of last year. The decrease is distributed generally throughout the province.

**Nova Scotia**—A bill introduced in the provincial legislature by E. H. Armstrong, Commissioner of Public Works and Mines, dealing with the dispute between Nova Scotia Steel and Coal Co. and the Dominion Coal Co. over submarine coal areas, makes the following provision: After an investigation the Government may make such orders and regulations as may be deemed expedient so that these coal areas may be worked to the best interests of the province. The Government is authorized to turn any area over to another lessee providing compensation is made to the present holder, either in cash or in other areas, or partly in both. This measure is strongly opposed by the Dominion Coal Co. on the ground that its title to its submarine areas is held under legislative sanction. The Dominion company considers that this title should hold as the areas in question contain millions of tons of excellent coal easily mined and suitable for metallurgical use; on the other hand, the areas proposed for exchange have not been proved to contain coal. It is further claimed that the company's security holders are interested and that the property pledged to them would not be changed without their consent.

### PENNSYLVANIA

#### Anthracite

**Wilkes-Barre** — William Porter and Michael Skurtis were instantly killed on May 9, in the No. 5 colliery of the Lehigh & Wilkes-Barre Coal Co. by a fall of coal and rock.

**Gordon**—The Barry Coal Co., operating a large washery near this place, is reported to have placed an order for the smaller sizes of anthracite which should keep its plant going for many months.

**Honesdale**—P. J. McDonnell purchased a culm pile at Marble Hill from the Howard Coal Co., of Scranton, for $50,000. It is estimated that the pile contains 96,700 tons of culm and that it will take two years to remove it.

**Hazleton**—Charles P. Neill, of the Conciliation Board, ruled that mine workers cannot expect to be reinstated in their jobs when discharged for incompetency. This case was the complaint of H. C. Singley against the Evans Colliery Co., of Beaver Meadow.

**Wilkes-Barre**—A subsidence of the surface occurred over a portion of the mine workings of the Conlon Coal Co. along Carey Street in Plains on May 12. It caused a weakening of the foundations of St. Paul's convent and the walls supporting a number of private residences in the vicinity.

**Scranton**—The Scranton Surface Protective Association, through its vigilance committee, is investigating alleged unhealthy conditions caused in the West Park section as a result of mine caves. It is reported that sewer pipes and water mains were broken by recent caves; also that mine cave repairs, by the Delaware, Lackawanna and Western company, were made in a careless way.

More or less serious caves, as the result of mining in the Diamond bed of the Delaware, Lackawanna and Western company, damaged the homes of several families in the 600 block of N. Summer Ave. on the night of May 10. This disturbance is a continuation of settlement of surface which has been occurring in this neighborhood for several weeks. Pillars are being robbed in this section and the coal company is taking precautions on the surface over these workings to safeguard the inhabitants living there.

**Pottsville**—Representatives of the Philadelphia and Reading Coal and Iron Co. testified before the Lebanon County commissioners, sitting as a board of revision and appeal, that the company's coal land holdings aggregating 4519 acres in Cold Spring Township, Lebanon County, are worth from $35 to $50 per acre. The commissioners recently increased the assessed valuation of the land to $140,000,000.

**Harrisburg**—The bill drafted by the attorney general requiring self-insurers under the Compensation Act to pay a state license of two per cent. based on pay roll, was presented in the House on May, by Mr. Ramsey, chairman of the Mines and Mining committee. The bill is a duplicate of that introduced in the Senate. It is designed to furnish funds to operate the Compensation Bureau. The House passed on third reading the bill making the lawful ton of anthracite coal 2000 lb.; it now goes to the Senate.

The Supreme Court, in an opinion rendered in the case of Mrs. Bridget Clark, of Parsons, against the Lehigh Valley Coal Co., reversed the decision of the lower courts and the Compensation Board, and sustained the decision of the Referee, George Beemer, in awarding the widow $2500. There was a question of whether his death was due to natural causes, or from causes other than in the course of his employment, or if it was due to the noxious gases in the mine, causing vomiting and resulting in the rupture of a blood vessel.

**Luzerne**—The Carnegie Hero Fund Commission in its report for this year makes two awards for local acts of heroism which took place in 1917. An explosion occurred at the Hillman colliery of the Wilkes-Barre Anthracite Coal Co., at which time Leroy Winters was killed, David A. Cadwalder met his death in an effort to save Winters and John Harry made a vain attempt to rescue the men who died.

The commission awarded a bronze medal to the widow of Cadwalder, and also $10 a month with $5 additional for each of her five children while they are dependent upon her and not over 16 years of age. John Harry was awarded a bronze medal and $1000.

#### Bituminous

**Russellton**—The Republic Collieries Co. of this place, is making a number of improvements at its No. 2 mine, at a total cost of $300,000. The shaft is being enlarged and lined with concrete, and the wooden tipple is to be replaced by a steel structure. Frank Foye, of Brownsville, Penn., has the contract work.

**Patten**—The Barnes Coal Co., has a large crew of men clearing the land near their operations in the vicinity of this place. They are preparing a suitable site for the erection of 50 houses, two of which are completed. The foundations for ten have been laid and as soon as the land is in shape the others will be commenced. The houses are of brick construction and the greater number will be of the bungalow type.

**Altoona**—A. L. Anderson & Bros., Inc., Altoona contractors, have the construction of a 3900-ft. siding for the Cambria and Indiana Railroad Company. This branch line is to run to the new mine of the Commercial Coal Mining Co., at Red Mill, Blacklick Township, Cambria County. The coal company is preparing to develop the property by means of a slope, work on which was started by Foye Bros., of Ebensburg.

**Uniontown**—Stockholders of the Orient Coke Co. held their annual meeting in this place, elected officers and directors and in-

spected the company's plant in Redstone Township. R. M. Fry was re-elected general manager for the sixth consecutive year. The officers and directors re-elected were Julian Kennedy, Pittsburgh, president; Robert Bentley, Youngstown, Ohio, first vice president; J. W. Kennedy, Pittsburgh, second vice president; J. O. Miller, Pittsburgh, secretary-treasurer; R. M. Fry, Uniontown, general manager. Other directors elected were Julian Kennedy, Jr., and David Davis, Pittsburgh.

**Johnstown**—A number of local men are interested in the Sandford Coal Co. of which John C. Cosgrove is a prominent stockholder. This new firm is having a steel tipple erected and modern mining mechinery installed. Developments are being pushed rapidly, a shaft was sunk to coal recently and the mine is being opened up in the seven-foot seam of coal here. Electric equipment is being installed. Mr. Cosgrove is interested in other plants in this field; one mine is producing 2000 tons daily. The field controlled by Cosgrove and Co. consists of 8000 acres of high-grade seven-foot coal.

### WEST VIRGINIA

**Holden**—A new tipple at the No. 2 mine of the Island Creek Coal Co. at this place will be erected at once to take the place of the old tipple which was destroyed by fire about the first of May. The fire damage was $50,000.

**Bluefield**—The Glen Alum Fuel Co.'s store together with its contents were completely destroyed by fire on the night of May 12. The loss is stated to be $60,000 partly covered by insurance. The origin of the fire is unknown.

**Philippi**—The large tipple of the Consolidation Coal Co. at Berryburg, Barbour County, was entirely destroyed by fire on the night of Wednesday, May 7, the loss being estimated at $40,000. As soon as practicable another structure was begun and a temporary structure was utilized for loading coal.

**Clarksburg**—Fire destroyed the tipple at the plant of the Southern Coal and Transportation Co., at Berryburg on May 9, entailing a loss of $20,000. It is believed to have been the work of incendiaries and officers are investigating the matter.

A deed in the county clerk's office states that the Corona Coal Co., successors to the Commercial Coal and Coke Co., purchased the Reynolds estate from Floraneus, for $20,000. This tract is at Hepzibah and contains approximately 100 acres.

**Hinton**—Development of the coal resources of Greenbrier County, heretofore almost untouched, is indicated by the prospecting under way at the present time and by the purchase being made of coal land in that county with a view to future development, the Canden Coal Land Co. just having purchased a large acreage near Rupert. More extensive development has been prevented because coal lands were inaccessible but it is believed that additional railroads will soon stimulate greater mining activities in Greenbrier County.

**Fairmont**—The following officers were elected at a meeting of the Northern West Virginia Coal Operator's Association on May 9: C. H. Jenkins, treasurer of the Hutchinson Coal Co., was re-elected president; he was the first president of this association. George T. Bell, executive vice-president, was chosen secretary. A. Lisle White, of Clarksburg was elected treasurer, succeeding C. J. Ryan of Hepzibah.

The West Virginia State Department of Mines held an examination for mine foremen at this place on May 13. The chief of the department, W. J. Heatherman, took personal charge of matters. The preliminary examination consisted chiefly of questions relative to the minings laws of the state; next the map work was taken up, the ventilation of mines being traced on blueprints; a third session completed the mine foremen's examination. An examination for fire bosses was also held, dealing at length with the gaseous condition of mines.

The subject of railroad fuel is a live one all over the country because of its magnitude and especially so in the Fairmont region because it is a substantial part of the business here. Accordingly the Northern West Virginia Coal Operators' Association, on May 9, decided not only to ask the Baltimore and Ohio Railroad Company to furnish figures on the railroad fuel loaded on that road, but also to secure the same information on other roads. This association represents coal operations aggregating 80 per cent. of the tonnage of northern West Virginia, or 20,000,000 tons annually.

**Huntington**—At a meeting of the West Virginia Coal Association held in this city on May 13 the selection of C. H. Jenkins of Fairmont and Quinn Morton, of Charleston, as directors of the National Coal Association was confirmed and Jarius Collins was indorsed for director at large for West Virginia. The holdover directors are T. B. Davis of Holden and John J. Tierney of Powhatan. J. G. Bradley of Dundon, president of the association, was elected as chairman of the delegation which is to attend the National Coal Association meeting. The executive committee of the association went on record as opposing the contemplated order of the Railroad Administration prohibiting the shipment of West Virginia coal for railroad use north of the Ohio River and sent a vigorous protest to Washington.

In the week ending May 10 substantial progress was made in the Logan field of West Virginia in the effort of the mines there to get back to normal production, the output being 23,000 tons in excess of the week ending May 3. The total production in this field was 161,000 tons, or 52 per cent. of full time capacity, and only about 40,000 tons less than the production for the corresponding period of 1918. Production losses were further reduced, being for the week above given only 140,000 tons, with 131,000 tons as the no market loss, a decline of 13,000 tons in that respect, losses from car shortage, labor shortage and mine disability cutting little or no figure. It has been largerly through additional lake orders that the mines of the district have been able to forge ahead, though coal from the district is being marketed generally in the West. During April the total production of the district was 572,000 tons or about 40 per cent. of normal. In April, 1918, 886,000 tons were produced.

**Charleston**—A score of mines on the Kanawha, Glen Jean & Eastern branch and the White Oak branch of the Chesapeake & Ohio railroad whose coal was transported over this road during the war will ship coal in the future via the Virginian Railway. Half a dozen mines on the Stone Coal branch of the Virginian will at the same time be reached by the Chesapeake & Ohio hereafter, although served by the Virginian Railway during the war.

The organization in this city of the Black Band Consolidated Coal Co., with a total capitalization of $2,000,000, means not only a continuation of mining operations at Olcott, where the Black Band Fuel Co. formerly operated, but it means as well further development of the property in question embracing about 5000 acres of coal land. There are four mines on this property which will be operated as soon as certain improvements are made. Incorporators of the new company include S. B. Avis, I. C. Jordan, and N. F. Young, all of Charleston; Wm. Freudenburger and Henry A. Jones of Pitsburgh, Penn.

Accidents of a fatal nature in the mines of West Virginia in April were less in number than for March, there being 14 deaths in April and 18 in March. Nine of the 14 deaths were from the usual cause—falling roof and coal. The only other death inside the mines was caused by a mine car. Mine cars were responsible for three and a motor for one fatal accident on the outside of the mines. There were three nonfatal accidents each in McDowell and Kanawha; Boone, Braxton, Fayette, Logan, Marion, Mercer, Mingo and Ohio each had one accident. A special effort is being made by the Department of Mines to reduce mine accidents to a minimum, the head of the department having issued specific instructions to guard against dust accumulations in the mines by providing additional doors where necessary.

Following the creating of four additional mine inspection district in West Virginia, it became necessary to rearrange the boundary lines of the existing districts. As so arranged the various districts are now constituted as follows:

First District—Barbour in part, Grant, Mineral, Preston, Tucker and Randolph in part.

Second District—Barbour in part, Harrison in part, Lewis, Marion in part, Preston in part, Randolph in part, Taylor and Upshur.

Third District—A part of Harrison and a part of Marion.

Fourth District—Marion in part, Monongalia and a part of Preston.

Fifth District—Harrison in part and Marion in part.

Sixth District—Brooke, Harrison in part, Marshall, Ohio and Wetzel.

Seventh District—Boone in part, Braxton, Clay, Gilmer, Greenbrier in part, Kanawha in part, Lincoln in part, Logan in part, Nicholas in part and Webster.

Eighth District—Kanawha in part, Logan in part, Mason and Putnam counties.

Ninth District—Fayette in part, Kanawha in part and Wyoming in part.

Tenth District—Boone in part, a part of Kanawha and a portion of Raleigh County.

Eleventh District—A portion of Fayette, a part of Kanawha and a part of Nicholas County.

Twelfth District—A part of Fayette, a part of Greenbrier, a part of Nicholas, a part of Raleigh and Summers Counties.

Thirteenth District—A part of Fayette and a part of Raleigh County.

Fourteenth District—A part of Raleigh and a part of Wyoming County.

Fifteenth District—A part of McDowell, all of Mercer and a part of Wyoming County.

Sixteenth District—A part of McDowell and a part of Wayne County.

Seventeenth District—A part of McDowell, all of Mingo, and a part of Wayne.

Eighteenth District—A part of McDowell.

Nineteenth District—Lincoln in part and Logan in part.

### OHIO

**Leetonia**—While at work in the Delmore coal mine near this place, Daniel Dempsey sustained injuries from a fall of rock. He died while being taken to the city hospital at Salem.

**Cambridge**—Joe Kotch, employed as a miner in the Harryette mine of the National Coal Co., was instantly killed by a fall of coal.

**Columbus**—A meeting of the Southern Ohio Coal Exchange was held in Columbus recently to name delegates for the Chicago convention of the National Coal Association, which will be held in the Windy City, May 21 to 23 inclusive. Much interest centers in the coming meeting of the National Coal Association.

**Nelsonville**—The Sunday Creek Coal Co., is installing a coal crusher at the Jobe mine near here which will be ready for operation within a short time. The crusher has a capacity of 1000 tons daily and will be used to prepare coal for several railroad contracts covering mechanical-stokers fuel. The machine is a Jeffrey crusher of the latest type.

### ILLINOIS

**New Douglas**—The Madison County Mining Company struck a fine 7½-ft. seam of coal near this place in Madison county, on the Toledo, St. Louis & Western Railroad. It is believed that the seam is the same as that at Sorento, in Bond County.

**Duquoin**—The new coal crusher which the Victory Collieries Co., of Tamaroa, north of here, is installing at their plant is rapidly nearing completion and will improve output.

An explosion at the Marion County Coal Company's mine at Glenridge, near Centralia, occurred May 12, killing four men. The men—John Dicercon, Henry Cooley, Bux Burgess and Robert Thompson—were shot firers in the mine and a windy-shot was the cause of the accident. The fact that it happened at 5:25 in the evening probably saved many more lives as these four men were the only ones in the mine at the time. Mine Rescue teams from Duquoin, Benton and other southern Illinois towns were immediately called and with their combined efforts all of the four bodies were taken out within 36 hours. The fire which was caused by the explosion has not yet been extinguished.

**Belleville**—The St. Louis & O'Fallon Coal Co. has reported to the police of this vicinity that brasses to the value of $200 were stolen from the so-called Nigger Hollow mine a few nights ago. It is said that the thief came to the mine with a wagon, loaded up the brasses and then drove away. The mine announced that a reward of $100 would be paid for the arrest of the thief.

**East St. Louis**—State Mine Inspector Harry Thompson of this place recently visited southern Illinois for the purpose of reviving mine rescue teams throughout the district. Special interest is being shown along this line because of the coming meeting at Springfield, Ill., in September, when all the teams will compete against each other. A movement is on foot to offer as prizes to the winning teams, a free trip to the dedication of the new Bureau of Mines building which is to be held at Pittsburgh, Penn., about October 1.

**West Frankfort**—Judgment has been given A. Sedden against the Old Ben Coal Corporation for $25,000 on account of damages to Sedden's property, coming from a subsidence of the surface. There are twenty-two cases of this kind on the city court docket. The plaintiffs contend that the coal company is violating the state law in not leaving sufficient pillarage after the coal has been removed. Many residence property owners along East Oak Street and East Elm Street in the southeastern part of the city say they have suffered heavy damages from this cause and after the filing of the several suits for damages the Sedden case was tried as a test case.

## Personals

**C. H. Roland** resigned, on May 14, his position as superintendent of the Upper Lehigh and Hazle Brook collieries of the J. S. Wentz Co. **L. W. Muir** has been appointed superintendent at Upper Lehigh and **E. P. Humphrey** at Hazle Brook.

**A. A. Layne** has been appointed as assistant general manager to the following coal companies: Logansport Coal Co.; Pittsburgh and Allegheny Coal Co.; Pittsbur h and Clarion Coal Co.; and the Pittsburgh and Cambria Coal Co.

**F. X. Meehan** has recently been appointed advertising manager of the Walter A. Zelnicker Supply Co., of St. Louis, Mo. Mr. Meehan has had a broad experience in various executive capacities with a number of well known firms.

**Roland B. Page** has recently been appointed eastern district manager for Leaway **Company, the** manufacture centrifugal pumping machinery. His offices are at 810 **Broad Exchange** Building, Broad and Franklin Streets, Boston, Mass.

**Carl Becker,** who previous to entering the service was with the Union Colliery Co., at Cambridge, Ohio, and Duquoin, Ill., has recently received an honorable discharge from the army and has taken a position in the St. Louis office of the Peabody Coal Co.

**C. H. Jenkins,** treasurer of the Hutchinson Coal Co. was the unanimous choice of the directors of the Northern West Virginia Coal Operators' Association as a member of the board of directors of the National Coal Association to represent the former Association.

**W. P. Engleman** has been retained as chief engineer of the Domestic Coke Corporation, of Fairmont, W. Va. During the war Mr. Engleman was in the service of the Government as a coke and byproduct expert; he has resigned his government position and has established his headquarters in Fairmont.

**A. E. Hitchner** has been appointed manager of the mining section of the industrial sales department of the Westinghouse Electric & Manufacturing Co. with headquarters at East Pittsburgh, Penn. Mr. Hitchner joined the Westinghouse sales organization as industrial salesman in their Philadelphia office in 1909. In 1912 he was sales representative in charge of the Wilkes-Barre office of the company.

**S. G. Pierson,** formerly vice president and general purchasing agent of the Colorado Fuel and Iron Co., recently has been made vice president and treasurer. **J. B. Marks,** formerly assistant to Mr. Pierson, was promoted to the position of purchasing agent. **D. A. Stout,** chief engineer of the fuel department, has been appointed assistant manager of that department, taking the place of **B. J. Matteson,** recently made the president's chief industrial representative. Mr. Stout will also continue as chief engineer.

## Obituary

**Jasper A. Writer,** secretary and treasurer of the Colorado Fuel and Iron Co., and for more than 37 years in the company's service, died Mar. 19, 1919. Mr. Writer was 61 years old. He began work for the company in 1881; in 1892 he was made general auditor, in 1912 secretary and later secretary-treasurer.

**Alva Tompkins,** one of Pittston, Penn.'s, early settlers and a pioneer of the anthracite coal industry, died at his home in Tunkhannock, on May 14. He was 92 years of age. Mr. Tompkins was prominently connected with the mining and shipping of coal during its early development period. He was in the coal business for 34 years, starting in 1851. Mr. Tompkins owned the second breaker built in the anthracite region and shipped coal for eight years prior to the building of this structure. He held a controlling interest in a number of coal companies operating at present; he was also interested in a number of banks and was connected with educational institutions.

## Coming Meetings

**American Wholesale Coal Association** will meet on June 3 at Cleveland, Ohio. Secretary, L. Romanski, Chicago, Ill.

**Illinois and Wisconsin Retail Coal Dealers' Association** will meet at Hotel Nelson, Rockford, Ill., June 4 and 5. Secretary, I. L. Runyan, Chicago, Ill.

**Southwestern Interstate Coal Operators' Association** will hold its annual meeting June 10 in the Keith and Perry Building, Kansas City, Mo. Secretary, C. N. Fish, Leavenworth, Kan.

**American Society of Civil Engineers** will hold its forty-ninth annual convention in St. Paul and Minneapolis, Minn., June 17 to 20. Secretary, C. W. Hunt, 33 West 39th St., New York City.

**Mine Inspectors' Institute of the United States of America** will hold its annual meeting July 8 to 11 at Indianapolis, Ind. Secretary, J. W. Paul, Pittsburgh, Penn.

**Kentucky Mining Institute** will hold its annual meeting June 6-7 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

**American Institute of Mining and Metallurgical Engineers** will hold its fall meeting Sept. 22 to 26 in Chicago, Ill. Chairman Chicago meeting, Carl Scholz, 547 West Jackson Boulevard, Chicago, Ill.

**American Society of Mechanical Engineers** will hold its spring meeting at the Hotel Statler, Detroit, Mich., June 16 to 19. Secretary, Calvin W. Rice, 29 West 39th Street, New York City

**American Institute of Electrical Engineers** will hold its annual convention at the Lake Placid Club, Adirondacks, N. Y., June 24 to 27. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

**Northeast Kentucky Welfare and First Aid Association** will hold a first-aid contest July 4 at Pikeville, Ky. Secretary, E. H. Sowards, Pikeville, Ky.

**The Rocky Mountain Coal Mining Institute** will meet in Salt Lake City the first week in July, 1919. Secretary, F. W. Whiteside, Denver, Colo.

**West Virginia Coal Mining Institute** will hold its semi-annual meeting June 3 and 4 at the Frederick Hotel, Huntington, West Virginia. Secretary, Karl F. Schoew, Huntington, West Virginia.

## Industrial News

**Ashland, Ky.**—The Green Rock Coal Co. has filed notice of an increase in its capital from $25,000 to $50,000, for expansion.

**Williamsburg, Ohio**—The Polley Coal Co., has been chartered with a capital of $25,000 by James Sheehy, U. S. Siler, John R. Howard and B. E. Sheehy.

**Memphis, Tenn.**—The Memphis Coal Co. has filed notice with the secretary of state of an increase in capital from $60,000 to $100,000, to provide for general expansion.

**Bunceton, Mo.**—A. H. Pearson and associates are understood to be having plans prepared for the early development of cannel coal properties located in Cooper County.

**Hazard, Ky.**—The Kentucky River Coal Mining Co. has filed notice with the secretary of state of an increase in its capitalization from $150,000 to $250,000, to provide for expansion.

**Coalfield, Tenn.**—The Coalfield Coal Co. is understood to be arranging plans for the rebuilding of the electric power plant at its properties recently destroyed by fire, with loss estimated at $5000.

**Bristol, Va.**—The Floyd-Elkhorn Consolidated Collieries have filed notice with the Secretary of State of an increase in their capitalization to $315,000, to provide for general business expansion.

**Memphis, Tenn.**—The Turner & Turner Coke and Fuel Co. has been incorporated with a capital of $50,000 to engage in the production of coke and other fuels. G. S. and L. E Turner are the principal incorporators.

**Ashford, W. Va.**—The Curtis Branch Coal Co. has been incorporated with a capital of $25,000 to engage in general coal mining in the Ashford district. E. E. Huddleston, Charleston, is the principal incorporator.

**Whitesburg, Ky.** — Samuel Collins, Whitesburg, and associates, have completed negotiations for the leasing of extensive coal properties in the vicinity of Sergent, Ky., and are understood to be arranging for early development.

**Barbourville, Ky.**—The Kentucky Velvet Coal Co. has been incorporated with a capital of $150,000 to engage in general coal mining operations in the vicinity of Barbourville. C. C. Smith, W. B. and Walter Riley are the incorporators.

**Buckhannon, W. Va.**—The West Virginia & Pennsylvania Coal and Coke Co. has been incorporated with a capital of $50,000 to engage in general coal mining operations, etc., in the vicinity of Buckhannon. A. M. Minerd and O. B. Talbot are the principal incorporators.

**Charleston, W. Va.**—The Siler Coal and Land Co., recently organized with a capital of $150,000, is understood to be planning for the commencement at an early date of the development of a total of 15,000 acres of coal properties recently acquired. T. E. Siler is the principal incorporator.

**Charleston, W. Va.**—The Black Band Coal Co. has been incorporated with a capital of $2,000,000 to engage in coal mining operations in West Virginia. N. F. Young, S. B. Avis, I. C. Jordan and William Freudenburger, Charleston; and Henry A. Jones, Pittsburgh, Penn., are the incorporators.

**Columbus, Ohio**—The Pennsylvania lines announce fuel contracts for more than 2,500,000 tons. Several Hocking operators will share in on these contracts. The George M. Jones Co., secured 572,000 tons and the Elk Coal Co., 114,000 tons. The average price was around $2, for mine-run.

**Dora, Ala.**—The Mary Lee Coal Co., recently incorporated with a capital of $15,000, has perfected its organization plans, and is arranging for the commencement of work at an early date on the development of about 160 acres of coal properties. It is planned to have a capacity of about 200 tons daily. J. Johnson is president.

**Paintsville, Ky.**—The Wells-Elkhorn Coal Co., recently organized, is planning for the installation of new mining machinery and equipment in three mines, including motors and auxiliary appartaus. It is understood that the company is arranging for the construction of a power plant for works operation. C. O. Messenger is general manager.

**Chattanooga, Tenn.**—The Suck Creek Coal Co., recently organized with a capital of $350,000, is arranging for the early development of approximately 25,000 acres of coal properties in the Chattanooga district. The company has acquired the mines of the Montake Coal Co. for operation. G. F. Mehan is president; Z. C. Patten, vice-president; and C. L. Hall, general manager.

**Chicago**—With war orders, high prices and careful management the O'Gara Coal Co. which failed in 1912 is now solvent. This fact became known in the federal court when Judge Carpenter allowed all claims of creditors, except one for $1,500,000 by Thomas J. O'Gara, former head of the company, presented as the value of property turned over by him to the receiver.

**Louisville, Ky.**—The Illinois Central R.R., has requested the Louisville District Freight Traffic Committee for a revision of rates on coal from mines in Western Kentucy to Paducah, Fulton, Mayfield and intermediate points, asking the removal of preferential rates on nut, slack and pea coal, and for the placing of western Kentucky and Southern Illinois on a parity. The Southern R. R. has asked for a 10 cent per ton advance from mines on its Tennessee lines also Kentucky and Virginia lines to sations on the Elkin & Allegheny Ry. in North Carolina.

**New York, N. Y.**—The coal trade in the last four Liberty and Victory Loan campaigns subscribed a total of $62,510,450, to which should be added a liberal subscription for the First Liberty Loan, but which was not credited to the industry as such. In addition the local trade contributed $119,937.75 to the Red Cross and $188,572.49 to the War Work campaign. The trade feels that its record in this respect is worthy of commendation and those who have been in charge of the campaigns, particularly Michael F. Burns, John E. Berwind, Richard H. Williams and LeBaron S. Willard take the occasion to congratulate their associates upon the showing which has been made.

# MARKET DEPARTMENT

EDITED BY ALEX MOSS

## *Weekly Review*

### *Demand for Hard and Soft Coal Growing Better—Production Figures Show an Increase in Output—Indications Point to a Serious Labor and Car Shortage in the Fall—Bituminous To Be Scarce Before Long—Anthracite Mines Busy*

THAT the demand for both anthracite and bituminous coal is increasing from week to week is proved by the gradual betterment in the output of the two kinds of fuel. During the week ended May 10 (the latest complete statistics available) there were produced 8,430,000 net tons of bituminous and 1,759,000 net tons of anthracite, as against 8,015,000 net tons of the former and 1,695,000 net tons of the latter in the week ended May 3.

Many large consumers of soft coal are still buying only for current requirements, in the belief that they will be able to contract for larger tonnages at any time. But this policy, to say the least, is an evidence only of shortsightedness on the part of those who pursue it. Based on present conditions, it requires no vivid imagination to foresee a coal scarcity next winter every bit as serious as that which the country experienced a year ago. There are several good reasons for this statement.

First, there is going to be a labor shortage. Not only has no new labor come into the United States for some time, but there has been a general exodus of foreign labor from our shores. More laboring men are returning to the countries of their origin than ever before in our history. This condition already is making its effect felt on the coal industry. One corporation operating a number of mines in Southern Illinois lost 583 men within a period of two weeks. Another company, operating mines in the East, has suffered a still greater loss covering a period of three months. An investigation conducted in the Hazard coal fields of Eastern Kentucky, where the mines are shipping large quantities of soft coal to the lakes, discloses that not an operation in that whole region has enough men. The result is that the mines are unable to produce anywhere near the tonnage reasonably expected of them.

This state of affairs promises to grow worse instead of better, for many mine workers, rather than wait until an improvement sets in to give them more regular employment, are leaving for more favored industries.

There is every reason to believe that there will be a serious car shortage next winter. Cars are plentiful at this time, it is true, but that is only because there is little demand for fuel. Let the demand become more pressing, and immediately it will be common knowledge that though the railroads have been discarding old and worn-out coal carrying equipment, they have not been adding new equipment to take its place. Our grain crop this year will be the largest we have ever harvested. Most of it will go abroad to feed starving Europe. The railroads will have to haul this grain to seaboard; and while they are hauling grain they cannot haul coal. At that very time, in the fall, the demand for fuel will be at its height. The result is obvious.

Conditions a few months hence are being discounted by bituminous operators, for many of them are growing distinctly conservative on contracts that call for deliveries through to next April. Sales agents are being warned to take care only of regular customers.

There is a quiet but steady inquiry for the better grades of soft coal, and prices are being maintained. The railroads are buying heavily, at prices ranging from $2.10 to $2.50, according to the district from which the coal is obtained. However, there are several large shippers who are still seeking May and June orders. There are sections, as in the Fairmont field of West Virginia, where there are plenty of miners but a great lack of spot business. For this reason operators in that field are quoting coal at prices lower than rule elsewhere; but even then the tonnage is disposed of with great difficulty.

The demand for the domestic sizes of anthracite continues strong from every quarter. There is a steady call from Canada, the West, and particularly from New England. The mines are operating to maximum capacity to meet the demand, and are doing their utmost to make up for the loss in production suffered the first four months of this year.

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#### WEEKLY COAL PRODUCTION

The improvement in the production of bituminous coal which was recorded during the week ended May 3 continued through the week of May 10, the output during which is estimated at 8,430,000 net tons as compared with 8,015,000 net tons during the week of May 3 and 7,378,000 net tons during the week ended Apr. 26. During the same week of last year improvement also occurred when compared with the week of May 4, 1918, but such improvement failed to equal that of the current week. The daily average per working day is estimated at 1,405,000 net tons and for the first time in a number of months exceeds the daily average for the calendar year to date, estimated at 1,359,000 net tons. For the period Jan. 1 to May 10 the production of bituminous coal is estimated at 152,218,000 net tons, and falls approximately 25 per cent below the output during the same period of last year, estimated at 201,023,000 net tons.

As in the case of bituminous production, improvement was also recorded in the anthracite field during the week ended May 10, the production being estimated at 1,759,000 net tons. The daily average during the week ended May 10 is estimated at 293,000,000 net tons, and while considerably below the daily average during the corresponding week of 1918, estimated at 334,000 net tons, it is far in excess of the daily average for the calendar year to date, estimated at 242,000 net tons.

Shipments of bituminous coal to all points from tidewater harbors during the week ended May 10 are estimated at 328,257 net tons, as against 397,174 net tons during the week preceding. Decreases during the current week occurred at all harbors with the exception of Philadelphia. The greatest decrease occurred at New York, the tonnage loaded declining to 178,250 net tons as against 235,141 net tons during the week ended May 3.

The tidewater shipments to New England during the week ended May 10 amounted to 72,409 net tons, which was a slight decrease compared with the tonnage moved during the week preceding, 84,176 net tons. Hampton Roads was the lone harbor to show improvement during the week, while shipments from New York decreased approximately 8400 net tons, or 20 per cent.

The production of beehive coke in the United States during the week ended May 10 is estimated at 261,115 net tons, as compared with 298,893 net tons during the week preceding and 623,993 net tons during the week ended May 11, 1918. Decreases in production occurred in Pennsylvania, West Virginia, Washington and Utah, while in other states the production was slightly in excess of that reported during the week ended May 3. For the calendar year to date the production of beehive coke amounted to 7,762,124 net tons as compared with 10,710,344 net tons during the same period of 1918. The daily average during the current week is estimated at 43,519 net tons as against 69,294 net tons during the calendar year to date, and 95,628 net tons for the same period of last year.

The bituminous coal dumpings at the lower lake ports during the week ended May 3 are estimated at 589,790 net tons as against 628,215 net tons during the week ended May 4, 1918. For the season to date, however, the dumping, estimated at 1,502,482 net tons, exceeds that for the same period of last year by approximately 180,000 net tons, or 15 per cent.

#### BUSINESS OPINIONS

**The Iron Age**—There is no mistaking the better feeling in the market following the dissolution of the Industrial Board and the freeing of the price situation from Government muddling. As at the original announcement of the March 21 prices, this last development has brought the release of some business held up for several weeks. That railroad buying before the end of the year will be on a considerable scale is more confidently looked for, as largely increased appropriations are discussed.

**American Wool and Cotton Reporter**—Fine wools are strong and low wools are coming in for a little attention at the present time. Prices are very firm with an advancing tendency. At the Cape, the United States, England and France have been buying rather heavily, and a large proportion of the wool has already been sold. Staple cotton is especially in demand, but is hard to obtain. Short cotton is in little demand at present. Mills are feeling much more optimistic on future business.

**Marshall Field & Co.**—Current wholesale distribution of dry goods is in excess of the corresponding week of 1918. Retail merchants continue to visit the market frequently and in greater numbers. All report excellent business. Orders from road salesmen, for both immediate and future delivery are in much greater volume, equaling any previous record. The market remains firm with retailers buying freely for fall. Some lines have been sold out. Collections are excellent.

## Atlantic Seaboard

### BOSTON

**Slow movement of bituminous. Railroad buying leaves large tonnage yet unplaced. Operators conservative as to contracts. Spot orders still sought. More confidence shown in future business. Navy bids awaited with much interest. Better outlook for export. Little inquiry for Hampton Roads coals. Anthracite in demand from every quarter. Noticeable decrease in tidewater shipments by several companies. Retail trade brisk.**

**Bituminous**—Receipts are on the same light basis that has been characteristic this season. The movement continues slow, and only through diligent canvassing is new business being developed. Many buyers are still "trying coals," the current market lending itself admirably to that method of delaying purchases. There are a good many steam-users in this territory who are buying from month to month on the theory that contract propositions will remain open until spot prices begin to swing upward, but manifestly there are pitfalls in any such policy. Admittedly, much of the present light output in all the regions is due very largely to lack of orders, but from week to week it is becoming increasingly apparent that were the orders in hand there would not be a sufficient supply of labor to get the coal.

So far as New England is concerned, no more railroad buying is anticipated this season. Although it is the policy of the Railroad Administration to publish the successful bids, there has been a good deal of secretiveness over the purchases made by certain of the roads in this territory. It is understood, however, that the range of price was about the same in every case, namely from $2.35 @ $2.55 f.o.b. mines per net ton; but aside from limited tonnages of high-grade gas coals for special runs, the average of quality would appear to be well below the customary mark. Many large shippers who have been customary channels of supply to the New England railroads this year are without a ton of locomotive business, and a large tonnage is left unplaced when comparison is made with other years. Of course, the roads here are buying something like a round million tons less than in 1917-1918, or nearly 15 per cent., but there is much interest in the trade to see what attitude certain of the large shippers will now take toward both spot and contract business.

It becomes increasingly clear that the producers in central Pennsylvania are growing distinctly conservative as to contracts that call for deliveries through to next April. Contract figures thus far have been on the basis of a dull market through the season, but certain interests who have the reputation of being far-sighted are warning their sales agents to take care only of regular customers. Buyers here are proverbially slow in sensing such a situation, and this may be another year when some of the larger consumers find themselves with increased business and without adequate provision for fuel supply. The activity of oil distributors has some bearing on this situation.

On the other hand, there are several important shippers who are still seeking May and June orders. There are sections, as in Fairmont, where there are plenty of miners, but a great lack of spot business. For this reason there are strong selling efforts at prices down to the railroad level and below, although the tonnage is absorbed only with great difficulty. There are frequent cases of "padding" on contracts, and consignees are complaining at the way their storage has been stuffed since Apr. 1. We know of plants where three to four months quota has already been received. Unless the production drops seriously below the present level, it is hard to see how there can be any broad market in New England until fall, unless the boom in general business comes earlier than is now looked for.

That a prosperous upturn is due some time between now and next spring is the way many people are talking. With the soldiers back, and peace conditions in the way of being restored in Europe, there is no doubt that commerce will improve rapidly. There are tremendous quantities of supplies that Europe will need from us, and it would seem that coal men are within bounds when they argue that coal will be very much in demand by October or November. Interests here are not quite so optimistic, but if the country is to have a prosperous wave it is probable that New England will get its share. Without doubt there is a lot more confidence in futures than was the case sixty days ago.

Meanwhile, there is only light buying of Pocahontas and New River in this market. The financial statement for April of the New England Fuel and Transportation Co. and related companies showed the extent to which the rehandling business has fallen off. It is the exception when an inland consumer takes his coal from tidewater; the great bulk of the tonnage is being supplied all-rail. Some expensive plants are practically idle, and overhead charges this year will reach record figures. Coastwise freights are easy; charters can be made at $1.50, Hampton Roads to Providence, and no takers. Were better dispatch to be had at New York piers, it is probable that a large number of soft coal barges would be diverted to the Long Island Sound trade.

Current quotations on bituminous at wholesale are about as follows:

| | Clearfields | Cambrias and Somersets |
|---|---|---|
| F.o.b. mines, net tons | $2.15@2.75 | $2.75@3.25 |
| F.o.b. Philadelphia, gross tons | 4.27@4.95 | 4.95@5.50 |
| F.o.b. New York, gross tons | 4.62@5.29 | 5.29@5.85 |
| Alongside Boston (water coal), gross tons | 6.10@6.85 | 6.90@7.55 |

Georges Creek is quoted at $3.20 per net ton f.o.b. mines.

Pocahontas and New River are being quoted at $4.69@5.14 per gross ton f.o.b. Norfolk and Newport News, Va. Alongside Boston the same grades are being offered at a range of from $6.89@7.24, and on cars Boston and Providence at from $7.60@7.90 per gross ton, the latter being the contract price f.o.b cars for season delivery.

**Anthracite**—The domestic sizes are in strong demand from every quarter. New England is no exception in this respect, and all the shippers find it hard to regulate the flow of coal in such way as to provide for the really urgent cases. The cool weather this spring and the comprehensive advertising indulged in throughout the country have combined to bring the public into the retail market to a greater extent probably since the years when strikes were threatened. Receipts both by rail and water are disappointing to all the retail dealers, for they are anxious to put out coal while consumers are eager to take it. In cities like Providence, New Bedford and Boston the retail demand has been unprecedented in the spring months. There are several cases where dealers have actually delivered in April from one-fifth to one-sixth of their normal tonnage for the year. Orders are still pouring in, and the average householder is not at all inclined to wait. He has the money to pay, and if he can't be served by one dealer he will try another.

To a notable extent some of the smaller distributors of anthracite at New York show a disposition to favor their all-rail business rather to the disadvantage of customers who take their coal by water. Heavy car demurrage, complaints of the lack of screening at the piers, and the bill of expense for operating barge lines are reasons enough for this attitude. In some cases dealers have been notified that they cannot look to their customary sources for the usual tonnage, and it all has a serious bearing on the volume of coal for New England. Opinions seem to differ whether there will be a quiet period in the summer, or whether this present extraordinary demand will be continuous.

### NEW YORK

**Domestic coals in heavy demand, with stove leading. Householders getting ready for vacations insist upon deliveries. Operators are doing their best to overcome deficit. Line dealers taking coal. Bituminous tidewater market slow, but all-rail trade is active. Brisk market anticipated within next few weeks. Manufacturers entering the market for the better coals.**

**Anthracite**—With nearly every consumer anxious to get his coal for next winter into the bin, the demand for the various domestic sizes of anthracite continues. Stove coal appears to be the favorite. This is due to the preparation accorded egg and chestnut last year, when the trade heard many complaints regarding poor coal. While egg showed large quantities of rock and slate, chestnut was complained of on account of the large quantity of pea it contained. As a result many consumers who have heretofore used egg coal in their furnaces have changed to stove for next winter. But even this change from one size to another has not caused any accumulation of either size in this market, and dealers continue to complain of the slowness of deliveries.

The mine owners are doing their best to overcome some of the loss in production so far this year in comparison with what was produced last year and the year previous. The mines are being operated as much as possible, and it is predicted that the tonnage figures for this month will compare favorably with those for April, which showed a substantial increase over those of the previous month.

The number of cars handled at the various local piers during the week ended May 16 was 5921 as compared with 6462 cars the previous week, a decrease of 541 cars. There were 3306 cars of anthracite standing on the docks on May 17.

The large producing companies claim to be booked well ahead for all the larger sizes, while many of the so-called independent operators are refusing orders for the time being, desiring to get rid of some of the orders now on their books before accepting additional business. Reports of premiums being offered for mixed cargoes of the domestic coals of so-called independents for quick delivery were current, but could not be verified.

Wholesale dealers report a heavy demand for all the larger coals from all sections of the country. There is a steady call from Canada, the West, and particularly from New England. None of these sections ought to complain of a lack of coal next winter if urgency counts for anything. Dealers are in frequent receipt of telegrams urging quick shipments.

Locally the demand is just as urgent. Many householders want their coal in the bins before they leave for the country or seashore, and retail dealers are kept busy explaining why they cannot get the coal. However, the dealers are employing all their help steadily.

There is not much activity in the local market for the anthracite steam sizes, but the so-called independent product is being readily absorbed along the line. Prices are strong for line trade, the better grades of buckwheat being quoted at from $3.15 to $3.40; rice, from $2.40 up, and barley from $1.50 up.

The trade has been curious concerning the interests to be included in the new retail corporation which is to be known as the William Farrell Son, Inc. There has been much guessing as to which of the present retail dealers will be included in the new company, but it was said early this week that no definite announcement would be made until the middle of the week.

Current quotations, white ash, per gross ton, at the mine and f.o.b. tidewater at the lower ports, are as follows:

| | Mine | Company Circular |
|---|---|---|
| Broken | $6.05 | $7.90 |
| Egg | 5.95 | 7.80 |
| Stove | 6.20 | 8.05 |
| Chestnut | 6.30 | 8.15 |
| Pea | 4.90 | 6.65 |
| Buckwheat | 3.40 | 5.15 |
| Rice | 2.75 | 4.50 |
| Barley | 2.25 | 4.00 |

**Bituminous**—The local tidewater situation is quiet. There is comparatively little doing in the spot market, but contract coals are moving in good shape. That a few weeks more ought to see a brisk market here is the opinion of many wholesale dealers. They see a trifle stronger market than existed last week, with bright prospects ahead.

Large manufacturers are said to be gradually entering the market, not wishing to be caught empty handed when the tide sets in, and are said to be about ready to buy large blocks at current prices.

There is a quiet but steady inquiry for the better grades, for which there is not much dickering in price. The poorer coals move slowly, some consumers wishing to take their chance of obtaining the better coals.

A betterment is noticed in production, and operators look for a still greater improvement as the season advances. There was a report current last week that central Pennsylvania operators had discussed the advisability of advancing the prices for the better grades of coal.

The railroads are buying heavily, and at prices ranging from $2.10 to $2.50, according to the district from which the coal is obtained.

Wholesale dealers look for an active market within the next few weeks. All-rail trade is picking up and prices are slightly better than on the tidewater basis. Most inquiries, however, lean toward the better coals, but these are scarce since most of the output is tied up in contracts. Operators having some free tonnage are not adding new contracts without considerable thought, and manufacturers who believe it will be easy to secure all the coal they require are likely to be disappointed.

There were handled at the local tidewater docks during the week ended May 16, 5597 cars of bituminous coal, as compared with 5133 cars the previous week, an increase of 464 cars. There were 3298 cars standing at the docks on May 17.

The quotations for the various coals at the mines, net tons, for spot delivery and contract, follow:

| | Spot | Contract |
|---|---|---|
| South Forks | $2.90 to $3.25 | $2.95 to $3.50 |
| Cambria County (good grades) | 2.75 to 2.95 | 2.95 to 3.25 |
| Clearfield County (good grades) | 2.50 to 2.75 | 2.80 to 2.95 |
| Reynoldsville | 2.50 to 2.75 | 2.75 to 2.95 |
| Quemahoning | 2.65 to 2.85 | 2.95 to 3.10 |
| Somerset County (best grades) | 2.65 to 2.85 | 2.95 to 3.10 |
| Somerset County (poorer grades) | 2.00 to 2.35 | 2.50 to 2.75 |
| Western Maryland | 2.25 to 2.75 | 2.50 to 2.75 |
| Fairmont | 2.00 to 2.25 | 2.35 to 2.50 |
| Latrobe | 2.10 to 2.25 | 2.25 to 2.40 |
| Greensburg | 2.25 to 2.35 | 2.35 to 2.60 |
| Westmoreland ¾ in. | 2.60 to 2.75 | 2.60 to 2.75 |
| Westmoreland run-of-mine | 2.35 to 2.60 | 2.35 to 2.65 |

## PHILADELPHIA

**Anthracite trade kept active by cool spring. Pea-coal situation greatly helped thereby. Stove and nut demand continues abnormal. Dealers plan to store nut this summer. Some complaint as to preparation. Present condition revives size-change talk. Retail price-cutting continues moderately. Steam demand unimproved. Buckwheat fairly taken; other sizes very free. Bituminous in fair demand. No call for spot coal. Some contracting. Rail agreements taken by some shippers.**

**Anthracite**—Owing to the unusually cool weather which has prevailed beyond the middle of May, retail dealers have enjoyed a large business on coal for current consumption. This has done much to offset the last few months of winter, when business fell off so badly as to make most dealers pessimistic as to the future. The chief call has been for pea size, of which all dealers have a goodly stock.

With the heavy demand for stove and nut coal for summer storing, the cool weather has greatly assisted the operators in that it has enabled them to dispose fairly successfully of their production of pea coal. Early in the week this size threatened once more to pile up at the mines, but with the lowering of the temperature the calls for this coal became more active. The big companies are still compelled to place a fair volume of this size in storage, however, and occasionally one of the smaller operators cuts the price in order to move it. The practice of offering stove and nut if pea is taken is growing among some of the lesser shippers.

The heavy drive on stove and nut coal continues unabated, and yards are occasionally out of the first-named size. A disappointing feature so far this month has been the lessened production at the mines. Some of the local dealers are bitter in their complaints at not having their orders for stove and nut filled. They fail to realize that this market is at this time taking more stove and nut coal than ever before due to the consumers almost abandoning the use of the other sizes.

There has been some complaint recently as to the preparation of coal coming to this market. There are the usual complaints as to the sizing, such as a continuation of the practice of increasing the percentage of pea in nut, but in addition to this much of the coal coming in has entirely too much dirt in it, the dealers claim. We have seen some shipments recently which fully justified this objection, but we believe it is far from general. Most of the consignees are taking the coal in without going further than calling attention to it, as they realize that under present conditions they are likely to have their supply curtailed if they become too particular as to the preparation.

The present strong demand for stove and nut, to the exclusion of pea, has again brought up among the dealers the question as to the advisability of having the operators adopt the two-size plan which they attempted to effect a few years ago. Now, as then, the retailers seem to favor such a proposition, as it would simplify their work in many respects and wipe out the many complaints they receive from customers unable to get a particular size to the exclusion of others.

From the operators' standpoint conditions are good, but always with the possibility of trouble due to an overabundance of pea coal, which will accumulate the moment warmer weather comes to stay. On the other sizes—egg, stove and nut—they have plenty of orders on their books right now to keep them running for at least six weeks without taking another order.

The price-cutting situation among the retailers is improved if anything. The most extensive cutter who ten days ago increased his pea coal price from $8 to $8.75, and also made advances on the other sizes, continues at this schedule. There are a few instances of prices less than these, one or two still selling coal around $8.50. Fortunately, this is now confined to one section of the city and the tendency is for it to diminish rather than increase.

There is absolutely no improvement in the steam coal situation. All the orders for buckwheat are being filled, with at times a surplus existing with some of the larger producers. No trouble is experienced in finding a buyer for the better grades of buckwheat, as contract customers are taking advantage of the situation to put in their regular winter stock of this size. Rice coal is only fairly well taken, with quite a tonnage going into storage, as is also the case with barley. There can be no denying that the anthracite steam sizes have been much affected by the condition of the bituminous market.

The prices per gross ton for line shipment and f.o.b. Port Richmond for tide are as follows:

| | Line | Tide | | Line | Tide |
|---|---|---|---|---|---|
| Broken | $5.95 | $7.80 | Buckwheat | $3.40 | $4.45 |
| Egg | 5.95 | 7.80 | Rice | 2.75 | 3.65 |
| Stove | 6.20 | 8.05 | Boiler | 2.50 | 3.50 |
| Nut | 6.30 | 8.15 | Barley | 2.25 | 3.15 |
| Pea | 4.90 | 6.50 | | | |

**Bituminous**—There is little activity in the trade, as with no spot coal in demand the production is kept down to the actual known needs of the market. Yet with it all the prices continue to be fairly well maintained within a radius of $3 to $2. Of course, there are at times a few sales for fine coals at a little higher figures, and vice versa. The inquiry for contract prices is still strong and with some new business being closed each week.

It is now known that a number of operators have closed contracts with the railroads for fuel supply. The prices range from $2.05 to $2.50, and some shippers hint that it is not for coal of particularly good grade. In some instances the contracts are only from month to month, while others have been made on a yearly basis.

The prices generally ruling at this time are covered by the following:

| | |
|---|---|
| Georges Creek Big Vein | $2.90 @ $3.00 |
| South Fork Miller Vein | 2.90 @ 3.00 |
| Clearfield (ordinary) | 2.75 @ 3.90 |
| Somerset (ordinary) | 2.55 @ 2.70 |
| Fairmont lump (ordinary) | 2.40 @ 2.50 |
| Fairmont mine-run | 2.15 @ 2.25 |
| Fairmont slack | 1.90 @ 2.00 |

# Lake Markets

## PITTSBURGH

**Increased activity brings closer price figuring. Market becoming steadier. Much railroad coal under cover.**

With more activity in the local coal market there has been closer figuring upon orders, with the result that some lower prices have been made, particularly by operators who recognized that with a heavier operation costs per ton would be reduced and profits would be increased rather than decreased by making slightly lower prices than would have been considered a few weeks ago. The coal operators have a perfectly business-like attitude in this matter, their desire being to place the coal market squarely on its own feet, believing that it will be able to take care of itself. Almost without exception the operators look for a higher market next fall and winter than will obtain this summer. Accordingly, they will not make prices for deliveries to the end of the coal year nearly as low as the prices made for deliveries in the near future. The lowest regular sales of steam coal hardly go below $1.90, while there are sales up to $2.35 for early deliveries, depending upon grade, and for deliveries over the remainder of the coal year concessions from the basic price of $2.35 are relatively insignificant.

Slack has experienced a decline, as is usual at this season of the year, when increasing lake shipments (¾-in.) augment the production of slack. Steam slack is now selling regularly at $1.70 to $1.80, with gas slack 10 to 20c higher. Lake shipments are now of good proportions, particularly in the case of gas coal.

A large volume of railroad coal business is now closed, and purchases are continuing. Each transaction is made on its own merits, the character of the coal and its location being the governing elements. The railroads are paying neither more nor less than the general consumer would pay for the same tonnage, quality and delivery. The best Pittsburgh steam coal for railroad use to Apr. 1, 1920, is bringing $2.35, while there are sales of Panhandle coal, and even of Connellsville, at less.

The market is now quotable as follows: Best grades gas coal, slack, $1.80@2; mine-run, $2.35; ¾-in., $2.50@2.60; 1¼-in., $1.60@2.70. Steam, slack, $1.70@1.80; mine-run, $1.90@2.35; all per net ton at mine, Pittsburgh district. Byproduct coal is not quotable, as there is scarcely any movement.

## BUFFALO

**Coal trade conditions show little change. Shippers hopeful. Anthracite in sharp demand. Rail trade cuts in on lake movement.**

**Bituminous**—While the tone of the reports coming from shippers is better than it was, coal must move more freely to bring about prosperity in the industry. The jobbers are doing what they can to maintain prices. In fact, they say they are doing more in that direction than are the operators. The signs of weakness in the slack trade would not have been in evidence if more of this fuel had been put into stock. It is customary to do that at this time of the year, and it might have been done now; but certain mines seem to have taken the view that it was best to sell it for what it would bring.

Canada still has considerable stocks of bituminous coal and wood that were bought to meet the demand last winter. Consumers are slow to contract for future requirements, while the fact is that the sellers do not care to bind themselves to anything that is likely to distress them later on.

While bituminous prices are not strong they are fairly steady at former figures, $4.65 for thin vein Allegheny Valley; $4.45 for Pittsburgh and No. 8 lump; $4.20 for same mine-run; and $3.80 for all slack, per net ton, f.o.b. Buffalo.

**Anthracite**—The demand is active locally and in all-rail markets, though the orders from upper-lake districts are not numerous. All that really disturbs the shippers is that if they yield to the eastern demand they may find themselves unable to get as much coal to the Northwest as they will need for winter. For a short time the lake loadings fell off badly, but now the shippers have returned to that branch of the trade and will endeavor to keep it up. This tends to make the local demand still more insistent; but that must go on for a while, as it is not possible to mine all the coal this summer that is to be used throughout the year.

The shipments by lake for the week were 97,100 net tons, of which 52,100 tons cleared for Duluth and Superior, 25,900 tons for Milwaukee, 7000 tons for Waukegan, 6000 tons for Chicago, 3200 tons for Fort William and 2900 tons for Marquette.

The city prices of anthracite to the end of May will be as follows:

| | F.o.b. Cars Gross Ton | At Curb Net Ton |
|---|---|---|
| Grate | $8.65 | $10.35 |
| Egg | 8.55 | 10.30 |
| Stove | 8.80 | 10.20 |
| Chestnut | 8.90 | 10.60 |
| Pea | 7.10 | 9.15 |
| Buckwheat | 5.80 | 7.85 |

With 25c. additional for loading to lake vessels.

## CLEVELAND

**Domestic bituminous coal is advancing in price while steam-coal is weakening. Demand for the latter is expected to improve as a result of the demise of the Peek Industrial Board. No. 8 operators still complain of large accumulations of slack. Lake coal is more plentiful than cargo space just now.**

**Bituminous**—Domestic consumers apparently are heeding the warnings that coal next winter is likely to be scarcer and higher, and demand is reported quite brisk. This is especially true of Pocahontas, and receipts are no more than equal to sales. Anthracite and domestic bituminous are being carried along on this buying wave. Some retailers have marked Pocahontas prices up another 25c., while West Virginia splint prices are due for a similar advance next week.

Steam coal, on the other hand, is moving rather slowly, though the outlook the past few days has taken a decided turn for the better. The industrial atmosphere seems to be clearing, as a result of the determination of the Peek Industrial Board. Iron and steel mill operations will increase shortly, it is believed, and while the summer run will show considerable fluctuation the trend all the time will be toward improvement. Huge piles of slack, which they are unable to move, are causing considerable concern to No. 8 district operators.

Considerable discussion of increasing costs is to be heard at present. Cost sheets are showing an unexpectedly heavy upturn, operators say, while at the same time they are expected to revise their prices downward. No. 8 district mines now are operating at about 55 per cent. of capacity. Whether they could do 10 per cent. more were every condition ideal is a question. Labor is scarce, skilled workmen are found to have left in unexpectedly large numbers, and what remains is markedly inefficient.

Lake coal seems to be settling around the $2.35 mark. With railroads taking most of their mine-run supplies from Ohio mines at $2.10, this figure now is probably the average for mine-run sales. Slack is reported as low as $1.50 in the past few days. Net ton delivered steam coal prices in Cleveland now are about 20c. lower than they have been.

The report of the Pittsburgh Vein Operators Association of Ohio for the week ended May 7 shows shipments totaling 5563 cars, divided as follows: Railroads, 988 cars; lake trade, 3685; Ohio, 698; Michigan and Indiana, 167, and Canada, 75. Car supply is approximating 100 per cent.

**Lake Trade**—Because of the delay in getting some of the larger lake freighters on the run this spring more coal cargoes are being offered at Lake Erie ports than carriers are available. The number of cars being handled by the car dumpers is increasing daily, and has run as high as 3300 cars in one day. All indications are that for some time, at least, bituminous coal will be moved up the lakes as fast as carriers are available.

Prices of coal per net ton delivered in Cleveland are:

| | |
|---|---|
| **Anthracite** | |
| Egg | $10.85@10.95 |
| Chestnut | 11.15@11.25 |
| Grate | 10.95 |
| Stove | 11.05@11.15 |
| **Pocahontas** | |
| Forked | 8.50@ 8.75 |
| Lump | 7.75@ 8.00 |
| Mine-run | 7.20 |
| **Domestic Bituminous** | |
| West Virginia splint | 7.30@ 7.40 |
| No. 8 Pittsburgh | 6.10@ 6.35 |
| Massillon lump | 7.30@ 7.40 |
| **Steam Coal** | |
| No. 6 slack | 4.10@ 4.30 |
| No. 8 slack | 4.50@ 4.65 |
| Youghiogheny | 4.70@ 4.90 |
| No 8½ in. lump | 5.15@ 5.30 |
| No. 6 mine-run | 4.20@ 4.30 |
| No. 8 mine-run | 4.50@ 4.65 |

## DETROIT

**Inquiries for bituminous coal are reported rather more numerous, but sales seem to have made no marked increase.**

**Bituminous**—While some of the jobbers find reason for believing a larger interest in the bituminous supply is developing in the Detroit market, owing to a slight increase in number of inquiries from manufacturing plants, the apparent improvement is said not to have progressed to a tangible growth of orders. The business is still pronounced unsatisfactory with sales falling far short of what jobbers believe should be their level at this time of the year.

Criticism is also directed at the breaking of prices below the schedule fixed by the Federal Fuel Administration, and some of the jobbers intimate that dealers who have been emphatic in urging the advantages of price stability appear to have been among those who sought to increase sales by offering concessions.

Approximate quotations at the mines, on a long-ton basis, place Hocking domestic lump at $2.50 a ton, mine-run at $2 and slack at $1.50. Coal from other leading districts of Ohio is said to be available at about the same prices. West Virginia splint or gas lump is quoted at $2.65, the three-quarter lump at $2.50, mine-run at $2.25 and slack at $2. Although little smokeless coal is arriving in Detroit, Pocahontas mine-run can be had, it is said, for $2.75 at the mine.

Heavy stocks remaining in possession of consumers of steam coal and in yards of retailers are described as constituting the chief check on sales, and progress in reduction of these stocks seems disappointingly slow.

**Anthracite**—Domestic buyers are not showing the willingness to stock up early that the experiences they have passed through during the last two seasons should develop, according to dealers. While receipts of anthracite are not of large amount, the supply is said to be sufficient to meet present requirements for each of the sizes favored for household heating plants.

**Lake Trade**—Shipments over the lake routes consist very largely, so far, of coal sent to producers' own docks. The supply of vessel capacity is more than equal to requirements of the tonnage moving. Owing to the scarcity of ore and grain cargoes for loading downbound vessels, a few of the carriers are coming down light to load coal, while a few that loaded coal some time ago, have not yet started their first upbound trip.

## COLUMBUS

**There is a better feeling in the Ohio coal trade due largely to the award of railroad fuel contracts. Operations are more active and future prospects are better. A period of activity is predicted during the next 60 days.**

The award of railroad fuel contracts, amounting to about 4,000,000 tons from Ohio mines, has stimulated the trade to a marked extent. The contracts were generally awarded at low prices, but on the whole the result will be that mines which have been idle for some time will resume operations. The general result is a better feeling in producing and shipping circles, and a large part of the gloom of the past few months is rapidly disappearing.

Beginning at once, the output of the various Ohio fields will be increased fully 50 per cent. over previous production figures. This is especially true of the Hocking Valley field proper, where operations have been working at about 35 to 40 per cent. of capacity. They are expected to reach 75 per cent. within a short time. In the eastern Ohio field a considerable part of the railroad tonnage will be produced, and operations will be correspondingly increased. Contracts for steam tonnage are still slow, although there is more of a disposition on the part of purchasing agents to secure data and figures.

The lake trade is also becoming more active as the season progresses. Shipments from the lower lake ports to the head of the lakes are becoming larger. Many lake agreements have been entered into with the price left blank, to be supplied later. Quite a few of the Ohio producers have their own docks in the upper lake region, and thus price is not a material matter at this time. The records of the loadings at the Toledo docks are showing up pretty well, and the same is true of loadings at other Ohio lake ports.

The domestic trade is still quiet, although some school contracts are being awarded at this time. The better grades, such as Pocahontas and West Virginia splints are in good demand, and prices are ruling higher. Ohio-mined grades are not moving well, although some dealers are inclined to buy better. Retail stocks are fairly well used up and not a great deal is being carried over. It is believed that the retail trade will open fairly early, and many dealers have made preparations accordingly.

## CINCINNATI

**Heavy demand for smokeless. Contract business picking up. Domestic demand better, with prices steady.**

The coal situation in Cincinnati is still quiet, the consumer remaining sanguine that there will be a sharp decline in price when the peace treaty is signed. One of the prominent coal dealers in this city, when interviewed in regard to the coal situation, had the following to say about conditions. "The consumer is still withholding orders, anticipating a drop in price. This decline, however, will fail to materialize; in fact, there is seen in the future a surer possibility of a rise in price. This condition might be changed somewhat after the meeting of the national association in Chicago, when the general public will learn the true state of affairs. They will be advised of possibilities of another serious car shortage, which will result in a repetition of 1917 conditions. While the sales in Cincinnati are not what they should be, there is a steady increase, and some lines in particular have shown an improvement. Smokeless coal has taken a sharp rise; the heavy demand for this grade continues, and the dealers are experiencing some trouble in filling orders as the supply on hand is rapidly diminishing."

There were several large orders placed last week for steam and semi-steam grades, and the contract business is looking up, several large contracts being signed. The demand for domestic grades has somewhat improved with prices steady. Prices on coke experienced a sharp break owing to a falling off in the demand.

## LOUISVILLE

**Domestic prices strong, with a fair demand for block and egg sizes. Steam grades and mine-run in dull demand, and operators being forced to cut prices in order to move steam. Contract prices fairly firm.**

Domestic prices are firm and stronger in practically every field of the state. In the Harlan and Hazard fields operators are getting from $2.85 to $3.10 per ton for block. In the Straight Creek field a price of $3.15 to $3.25 is asked, while on Jellico prices have advanced to $3.25 to $3.50 per ton. It is reported that Blue Gem coal is selling all the way from $3.50 to $4 a ton. Western Kentucky operators recently cut the price 5c. per ton on block, or from $2.60 to $2.55, making the latter price the standard. However, some western Kentucky spot block is selling at as low as $2.20.

Retailers have been stocking their yards freely, and are getting a few stocking orders from consumers. However, consumers are not stocking as they did at this time last year, and instead of being rushed things are a little dull with the retailers. However, the demand for block coal is coming better, and late buyers will probably meet with a high market.

In the coal fields the entire feature is the demand for block coal. Mine-run and nut and slack prices have gone off badly during the past two weeks. These reductions, however, are on spot coal only, as contract coal is holding firmly, due to the uncertain labor situation. Western Kentucky steam prices show mine-run quoted as low as $1.85 for spot, with the average market at $2.10 to $2.35. Nut and slack is selling at around $1.70, with poor grades quoted as low as $1.40. Some thin slack is selling as low as $1.40, it is reported. Local dealers report some Indiana run-of-mine offered on the market at $1.50 during the week.

Eastern Kentucky nut and slack is selling at prices ranging from $1.50 to $1.85 per ton, and mine-run at $2 to $2.35. It is understood that eastern Kentucky mines quoted $2 to $2.25 on mine-run to the Louisville & Nashville R. R., and that western Kentucky quoted $1.60 to $1.70 on the Louisville street railroad contract.

Coal is going principally into Michigan, Ohio, Indiana and Kentucky, with some movement into Georgia on mine-run. The Louisville & Nashville lines handled 301 cars of coal from Kentucky for the Lake district after Apr. 20 and up to May 1. The lake movement is now getting into good swing.

## BIRMINGHAM

**Demand for steam coal fails to show improvement. Strong inquiry for domestic fuel continues. Supply inadequate to meet requirements. Production from steam-domestic mines confined to half-time operations, there being no surplus stocks in the hands of producers.**

General industrial inactivity continues to affect the coal market in this district, and sales of steam fuel are being held down to current requirements of users. Trade conditions may be stated as satisfactory when considered in relation to the business of consuming interests, but not otherwise.

Both the wholesale and retail channels of domestic trade are featured by a good demand, and few domestic operations have any tonnage to offer between now and the end of the year. Such relief as may come will depend on the output of the steam-domestic operations which are now either

idle or running only half time, when such mines are again restored to full-time schedules.

Basic conditions in both the steam and domestic trade are considered stable, prices remaining firm and unchanged, with a strong probability of a shortage of domestic coal during the coming fall and winter. Retailers are now carrying on an advertising drive, in which consumers are urged to not delay in providing their supply of fuel for winter consumption.

Some improvement in production will soon be noted from the mines of furnace companies, the Woodward Iron Co. starting up one or two mines to supply coking coal on account of putting one of their furnace stacks in operation. Otherwise there is no change in the production end of the trade.

## Coke

### CONNELLSVILLE

**Continued decline in coke production. Fairly active prompt market. No contracting as yet for second half.**

With the continued decline in coke production in the Connellsville and Lower Connellsville region, there is less coke available for odd-lot sales and the spo market has stiffened further. It has no closely approached the level of values obtaining on monthly adjustments of contracts, just as should be the case. While $3.60 and even $3.50 was done on spo lots of furnace coke three or four weeks ago, the common quotation now is $4, and $3.75 could be done, if at all, only with difficulty. Nearly all contract settlements for May delivery were at $4.

Furnace coke shows a somewhat broader demand, but is not quotably higher. Iron foundry operations are evidently increasing, and as there was less contracting for foundry coke for the present half year than usually occurs, there is a fairly active prompt market.

More than half the furnace coke contracts now in force expire June 30, and both furnace men and coke operators are beginning to consider the matter of second-half contracts. There have been hardly any active negotiations as yet, and the feeling of the two parties is not disclosed; but the guess may be hazarded that coke operators would quote a flat price of $4 for the second-half while furnacemen would talk $3.50 or less. It seems improbable that contracts will be renewed on the basis of monthly price adjustment. This system has worked fairly well during the transitionary period since Government control was removed Feb. 1, but for the future both buyers and sellers prefer to settle the matter of price when they make the contract, rather than later in six monthly installments. Sliding scale contracts, based on a ratio of coke to pig iron, may however be considered.

The spot market is quotable at $3.75@4 for furnace coke and at $4.25@5 for spot foundry, per net ton at ovens. There is no contract market quotable.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended May 10 at 100,980 tons, a decrease of 32,626 tons. In some quarters of the trade doubt is expressed whether the decrease in production has been as great as stated.

**Buffalo**—The trade continues dull, with little prospect of improvement in the immediate future. The fact that the demand for iron ore at the furnaces is still light shows the condition of the iron market to be quiet. The movement of ore down the lakes has begun, but only a few of the steamers have been ordered into it. Ordinarily they would all be busy by this time. Prices remain at $7.25 to $7.60 for 72-hour foundry coke; $6.60 to $7 for 48-hour furnace, and $6.10 for off grades, per net ton, f.o.b. Buffalo.

## Middle Western

### MILWAUKEE

**Coal market is quiet and uneventful. Prices of all grades well sustained, however. Cargo receipts brisk for this season.**

The coal market at Milwaukee at present is quiet and devoid of anything worthy of special mention. Deliveries are being made at a normal rate only, as it is altogether too early to expect consumers to burden their minds with thoughts of another winter supply of fuel. Pocahontas of all grades is easily obtainable this year, and many are turning to this class of fuel because of the high price of anthracite. Illinois coal is being held up, despite heavy stocks everywhere. Production has been curtailed to meet the situation, and it is apparent that there is organized effort to sustain the price of western coal. There is considerable complaint as to the poor quality of coke now on the market. Those in position to know say the byproduct plants were compelled to use Illinois coal to some extent last winter, with the result that the coke is not up to the usual standard.

### ST. LOUIS

**Market continues inactive, with practically no demand for anything and a tendency on the part of the Standard operators to continue cutting prices. Both steam and domestic inactive in the city and country.**

There is no change in the local situation from that reported for the past few weeks. There is practically no call from the country for coal, and there is nothing to indicate that the domestic user in the country will do much storing before July or August, if then. The first country business will come from the threshing, which is expected this year about the middle of June. Beginning the first of June, therefore, there will be some threshing coal moving; but this seems to diminish in tonnage year after year, owing to the growing use of gasoline tractors.

The country demand is rather good for anthracite chestnut sizes. This coal is moving south through St. Louis for the first time in years to points in Texas and Oklahoma, and to places in Arkansas and the southwest. This is accounted for by the fact that no anthracite is moving via boat to New Orleans as in previous years, and such demand as comes from the southwest must be taken care of all-rail.

The local demand is off on everything. There is a little coal going into storage for domestic purposes, but it is so small that it is hardly noticeable.

In the Standard field the feeling prevails that every mine must work, with the result that the few that are working are cutting prices to get the little tonnage offered. The only thing in the field that looks at all promising is screenings, which seem to be getting stronger all the time.

Some mines work one day a week, some not as many as three days a week, and some have been idle for many weeks. Dissatisfaction is growing among the men.

In the Mt. Olive field conditions are somewhat better. Prices are rather firm, and there is a feeling of satisfaction with the business that this field has been able to take care of up to the present.

In the Carterville field of Williamson and Franklin County some improvement has been noticed during the past week in the movement of domestic sizes. There is at the present time a shortage of screenings and steam sizes. All the mines are on short time, but a fairly good tonnage seems to come in from the Northwest on domestic coals, while there is nothing doing in the St. Louis territory or south thereof. The same condition applies to the Duquoin field.

Cars are plentiful and movement is good. The Franklin County operators are expected to raise their prices on June 1 10c. above those quoted below, which are prices prevailing today:

| | Williamson and Franklin County Association: | Mt. Olive and Staunton | Standard |
|---|---|---|---|
| Lump, egg and nut. | $2.75 | ..... | ..... |
| Washed Nos. 1 and 2 nut | 2.85 | ..... | ..... |
| Independent: | | | |
| Lump, egg and nut.. | 2.55 | $2.55 | ..... |
| Lump and nut | .... | .... | 1.90@2.10 |
| Washed Nos. 1 and 2 nut | 2.85 | ..... | ..... |
| Mine-run | 2.35 | 2.20 | 1.60@1.70 |
| Screenings | 2.20 | 2.05 | 1.25@1.40 |
| 3-in. lump | .... | 2.30 | ..... |
| 2-in. lump | .... | ..... | 1.75@1.90 |
| 2x6 egg | .... | ..... | 1.80@2.00 |

Williamson-Franklin County rate to St. Louis is $1.07½; other rates $0.92½.

## General Statistics

### ANTHRACITE SHIPMENTS, APRIL, 1919

The shipments of anthracite for the month of April, as reported to the Anthracite Bureau of Information, show a substantial recovery from the slump which prevailed during the two closing months of the coal year 1918-19—February and March.

The quantity shipped from the mines in April amounted to 5,224,715 tons, as compared with 3,938,908 tons in March, and 3,871,932 tons in February.

The increase over March shipments was 1,285,807 tons. Notwithstanding this decided increase over March, the shipments in April this year were 1,143,658 tons less than in the corresponding month last year, when they amounted to 6,368,373 tons. The difference in weather conditions in the winters of 1917-18 and 1918-19, and also the speeding up of production last year because of the war, account for the smaller tonnage last month as compared with the corresponding month last year. As compared with April, 1917, the shipments last month showed a decrease of less than 370,000 tons.

The shipments by companies were as follows:

| | April, 1919 | April, 1918 |
|---|---|---|
| P. & R. Ry | 1,044,192 | 1,233,512 |
| L. V. R.R. | 865,924 | 1,175,027 |
| C. R.R. of N. J. | 481,781 | 528,886 |
| D. L. & W. R.R. | 885,215 | 1,008,016 |
| D. & H. Co. | 603,479 | 771,557 |
| Penna. R.R. | 383,250 | 448,374 |
| Erie R.R. | 581,453 | 695,186 |
| N. Y. O. & W. Ry. | 144,856 | 185,650 |
| L. & N. E. R.R. | 234,565 | 322,167 |
| Totals | 5,224,715 | 6,368,373 |

## Coal and Coke Securities

New York Stock Exchange Closing Quotations May 19, 1919

| STOCKS | Ticker Abvn. | Bid | Asked |
|---|---|---|---|
| American Coal Co. of Allegheny | (ACL) | 45 | ... |
| Burns Brothers, Com | (BB) | 143 | 151 |
| Burns Brothers, Pfd | (BB) | 99¾ | 110 |
| Central Coal & Coke, Com | (CK) | 55 | ... |
| Central Coal & Coke, Pfd | (CK) | 63 | ... |
| Colorado Fuel & Iron, Com | (CF) | 46 | 46 |
| Colorado Fuel & Iron, Pfd | (CF) | 105 | 125 |
| Consolidation Coal of Maryland | (CGM) | 75 | ... |
| Elk Horn Coal, Com | (EH) | 28¾ | 29 |
| Elk Horn Coal, Pfd | (EH) | ... | 47 |
| Island Creek Coal, Com | (ICR) | 39 | ... |
| Island Creek Coal, Pfd | (ICR) | 75 | ... |
| Jefferson & Clearfield Coal & Iron, Pfd | (JF) | 60 | ... |
| New Central Coal of West Va | (NCC) | 5 | ... |
| Pittsburgh Coal, Com | (PC) | 55¾ | 56 |
| Pittsburgh Coal, Pfd | (PC) | 88 | 89 |
| Pond Creek Coal | (PD) | 17 | 17½ |
| Virginia Iron, Coal & Coke | (VK) | 65 | 67 |

| BONDS | Bid | Asked |
|---|---|---|
| Cahaba Coal, 1st Gtd. 6s, 1922 | 90 | ... |
| Clearfield Bituminous Coal, 1st 4s, Ser. A, 1940 | 71 | ... |
| Colorado Fuel & Iron, Gen. 5s, 1943 | 91 | 93 |
| Colorado Indus. 1st Mtg. & Col. Tr. 5s, 1934 | 75 | 77½ |
| Consolidation Coal of Maryland, 1st Ref. 5s, 1950 | 89 | 90 |
| Jefferson & Clearfield Coal & Iron, Sec. Mort. 5s, 1926 | 96 | ... |
| Lehigh Valley Coal, 1st Gtd. 5s, 1933 | 99½ | 101 |
| Lehigh Valley Coal, Gtd. Int. Red. to 4%, 1933 | 79⅜ | ... |
| Lehigh Val. Coal & Nav. Con. S. F., 4½s, Ser. A, 1954 | 90 | ... |
| Pleasant Valley Coal, 1st S. F. 5s, 1928 | 80½ | ... |
| Pocahontas Coal & Coke, Joint 4s, 1941 | 84 | 88 |
| Pocahontas Con. Collieries, 1st S. F. 5s, 1957 | 88 | 88½ |
| Roch. & Pitts. Coal & Ir., Helvetia Pur. Money 5s, 1946 | 98 | ... |
| St. L., Rocky Mnt. & Pac. Stamped 5s, 1955 | 80 | 83 |
| Tenn. Coal, Iron & R.R., Gen. 5s, 1951 | 91½ | 95½ |
| Utah Fuel, 1st Sinking Fund 5s, 1931 | 87 | ... |
| Victor Fuel, 1st Mtg. Sinking Fund 5s, 1953 | 55 | 70 |
| Virginia Iron, Coal & Coke 1st 5s, 1949 | 85½ | 86½ |